User Manual

identiFINDER® 2

Digital Handheld Gamma Spectrometer with Radionuclide Identification

ICx technologies

identiFINDER 2
Dose Rate
5.395
µSv/h
0.000 cps Neutrons
Finder
Identify
Options
L
M
R
G
N

identiFINDER® 2/en/1.0(7801)/Dec2010

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Digital Handheld Gamma Spectrometer with Radionuclide Identification

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1 Welcome

This chapter offers introductory information about this manual, some important advice for your safety and that of the instrument, and a general overview of the ICx identiFINDER 2 and its accessories.

1.1 CONVENTIONS USED IN THIS MANUAL

This document uses the following conventions to signify various kinds of text.

Ordinary Text

looks like this, sometimes bold or italics is used for emphasis.

`Constant Width`

is used for URLs, file names, path names, text you have to enter somewhere.

Information about danger for yourself, the instrument, or data.

Information you should carefully consider before proceeding using the instrument.

Additional information you should pay attention to.

A tip suggests commands or procedures for advanced use of the instrument. You might skip tips on your first pass through this document.

The path to a command or setting in the ICx identiFINDER 2 menu hierarchy or the web interface, respectively, are displayed at the beginning of appropriate sections as shown in the following examples:

Options Menu (p. 69) ➢ More Options (p. 69) ➢ Identification Options (p. 69) ➢ Identification Settings

Settings (p. 164) ➢ General (p. 168) ➢ Identification

If you read this manual as a PDF document, you can click cross references, items in the table of contents, links into the Internet or similar to immediately view the designated item.

1.2 SAFETY WARNINGS

The ICx identiFINDER 2 is designed for outdoor use. When operated in accordance with the operating instructions it should not present any hazard to the operator.

■ The housing is essential to the integrity and safe operation of the instrument. Under no circumstances should the housing be tampered with, penetrated, or otherwise removed except for normal access to the external connectors (see chapter 5, p. 145 and 8, p. 201).

⚠ The power adapter is connected to line power. Normal care in handling such a line power device should be exercised. In particular this unit should not be connected to line power if it is wet.

⚠ There are no radiation hazards associated with the ICx identiFINDER 2 itself. The nature of the application is such that objects being surveyed could, of themselves, be hazardous.

1.3 INSTRUMENT SAFETY

The ICx identiFINDER 2 uses scintillation crystals (among other probes) to detect gamma radiation.

■ Scintillation detector crystals are extremely brittle. Handle the instrument with utmost care and never drop it.

■ Scintillation detector crystals may fracture when exposed to rapid temperature changes. The instrument should NOT be exposed to a sudden jump in temperature of 30 °C (54 °F). This should be considered if the instrument is being transported in a vehicle with a climate control system in regions where extremely high or low temperatures may occur.

1.4 BEFORE FIRST USE

We recommend charging the batteries of the ICx identiFINDER 2 after unpacking (8.6, p. 212) prior to first time use.

This is a good time to get familiar with the ICx identiFINDER 2 by reading this manual.

Please read at least the rest of this chapter and those on basic operation (chapters 2, p. 15 and 3, p. 37) before starting to experiment with the ICx identiFINDER 2.

Chapter 2, p. 15 explains the principles of operating the ICx identiFINDER 2 to get you prepared for the typical survey you will be guided through in chapter 3, p. 37.

A detailed reference on all the commands is given in chapter 4, p. 53, which you should read to know about all the features and possibilities in case you need them.

Chapter 5, p. 145 explains how to setup the connection of the ICx identiFINDER 2 to a local computer. The web interface for monitoring, configuring and data transfer is detailed in chapter 6, p. 159.

The setup for sending data to a remote server (reachback) is explained in chapter 7, p. 197

Chapter 8, p. 201 details the power supply for the ICx identiFINDER 2 and the handling of various battery types.

Simple trouble-shooting that can be conducted in the field is included in chapter 9, p. 215.

Chapter 10, p. 217 introduces the accessories optionally available for your ICx identiFINDER 2.

The Appendix contains tables with specifications of the ICx identiFINDER 2 (Appendix A.1, p. 231), a list of nuclides the ICx identiFINDER 2 can identify (Appendix B, p. 239), a glossary of terms and abbreviations (Appendix C, p. 249) and, finally, an index (p. 277).

1.5 THE ICx identiFINDER 2

The ICx identiFINDER 2 instrument engineered and manufactured by ICx Technologies is a digital all-in-one hand-held battery-powered instrument that places the power of an advanced spectroscopy laboratory in your hands featuring:

- Search for sources of gamma radiation or scan areas contaminated with gamma radionuclides
- Automatic identification of radio nuclides by analysis of gamma ray spectra
- Gamma dose and dose rate measurements
- Neutron detection with count rate and accumulated counts (Available only for models equipped with a neutron detector.)
- Continously stabilized gamma energy spectrum.

The ICx identiFINDER 2 is the modern successor of the identiFINDER, designed and build by the same team of experts formerly known as target systemelectronic. It is well-known around the globe and in daily use by thousands of users hunting for sources of ionizing radiation.

The ICx identiFINDER 2 is designed for the survey of objects ranging from small packages to large objects such as freight containers to search for illicit trafficking of radioactive material, to scan containers for radiation leaks, to monitor medical waste or scrap metal, you name it. It will detect and identify radioactive materials. If the type or quantity of radioactive material exceeds pre-set alarm levels then this information will be provided to you.

In particular, the ICx identiFINDER 2 will identify threat objects. A threat object is defined as radioactive material whose signature is consistent with that of material that could be used for terrorist purposes. Threat materials are usually those used in a nuclear explosive device or which could be used in Radiological Dispersive Devices (“ Dirty” bombs).

This ICx identiFINDER 2 incorporates advanced physics algorithms that enable sophisticated high quality scientific measurements to be made. However the user interface is designed such that it can be successfully operated by personnel with a minimum of training. The high degree of automation enables successful operation even in a distracting and hostile environment entirely at the push of a few buttons. The instrument is robust and stable, even in the most demanding of conditions.

The ICx identiFINDER 2 is available in various models (see A.1, p. 231 for detailed specifications). All models share almost identical operating procedures and are covered in this manual. The few places where a screen display or command of a certain model differs from the main stream are marked accordingly in the text.

If you are a user of previous identiFINDER models, you will appreciate the new features like:

- Brilliant color display with 320 by 240 pixels, that is more than 9 times the number of pixels for spectra. . .
- Large database capacity for more than half a million spectra or other data
- GPS receiver to log incident locations
- Wired communication via standard USB interface
- Wireless communication via Bluetooth for reachback
- Web interface allowing to monitor and configure the instrument without additional PC software
- Rewritten manual always at hand because it is included in the instruments memory

... and many more. See A.1, p. 231 for the complete specifications.

Despite all the innovation you will appreciate that it is still the same identiFINDER workhorse you've grown familiar with.

1.6 UNPACKING AND IDENTIFYING ACCESSORIES

The ICx identiFINDER 2 is available in several variants (see A.1, p. 231), each variant comes with a custom set of the accessories identified in Figure 1, p. 6 and the following list.

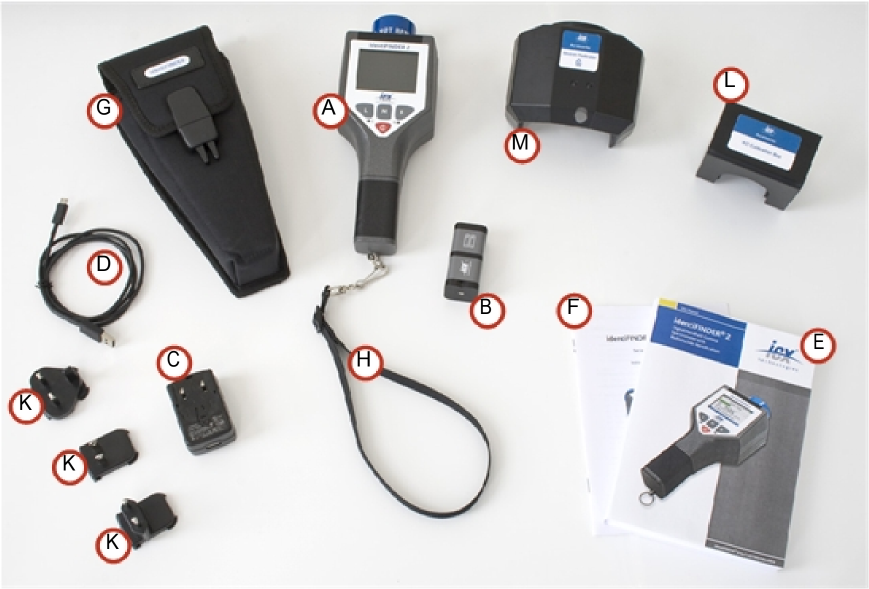


Figure 1. The ICx identiFINDER 2 with accessories.

Ⓐ ICx identiFINDER 2 instrument with ICx powerPACK ultra in handle B

ICx powerPACK 2

Ⓒ Wall power adapter with USB-A receptacle

Ⓓ Micro USB-B to USB-A cable for connection to local computer or wall power adapter (USB 2.0)

Ⓔ ICx identiFINDER 2 User manual (printed and/or PDF edition on CD-ROM)

Ⓕ ICx identiFINDER 2 Inspection report G

ICx identiFINDER 2 holster

Ⓗ Lanyard

Accessories depending on the configuration

Ⓘ Rimowa case with keys

Ⓙ Pelican case

Ⓚ International adapters for power adapter (US, Euro, UK) L

KCl Calibration box

Ⓜ PE Neutron moderator

Ⓝ Source Set

Depending on the configuration, the ICx identiFINDER 2 is shipped in different sturdy cases shown in Figure 2, p. 8 and Figure 3, p. 9).

Review the parts and components received. In the event that a component cannot be located contact the appropriate support organization (see Chapter A.3, p. 237).

A name plate (Figure 4, p. 10) is attached to the rear side of the instrument (Figure 7, p. 13). It lists the type of instrument, the serial number and other important information.

You might want to remember the serial number. It is sometimes used to identify the ICx identiFINDER 2 in a computer network.

After the initial charge, the ICx identiFINDER 2 is ready for use.

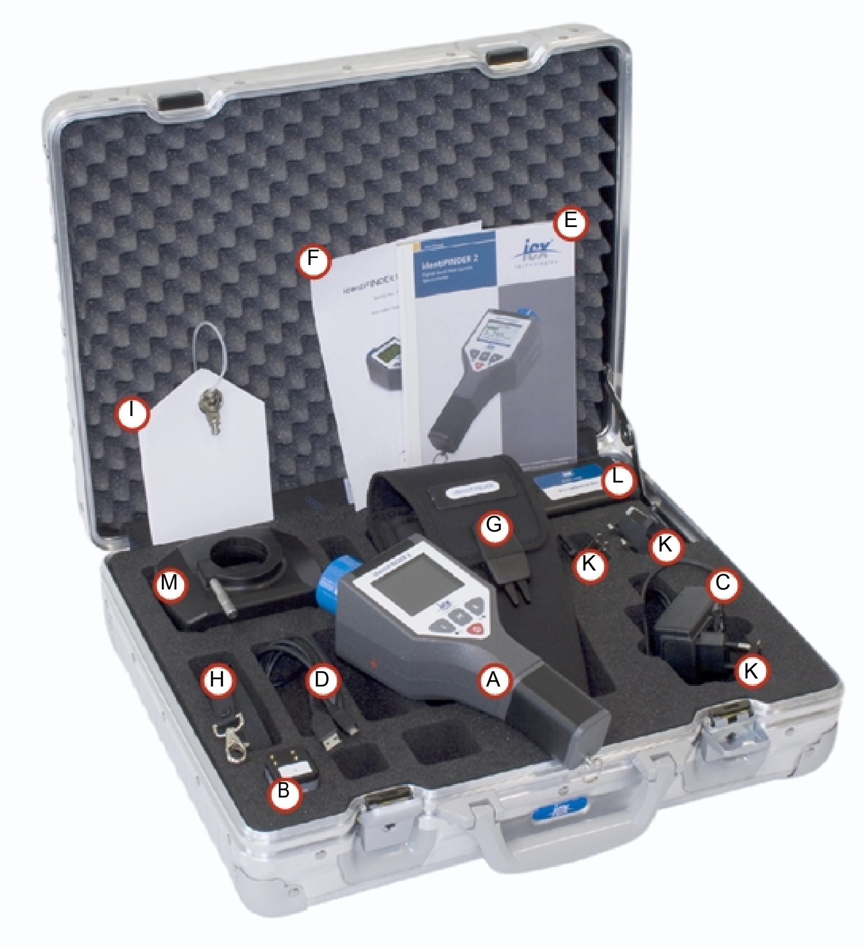


Figure 2. The ICx identiFINDER 2 with accessories in a Rimowa carrying case.

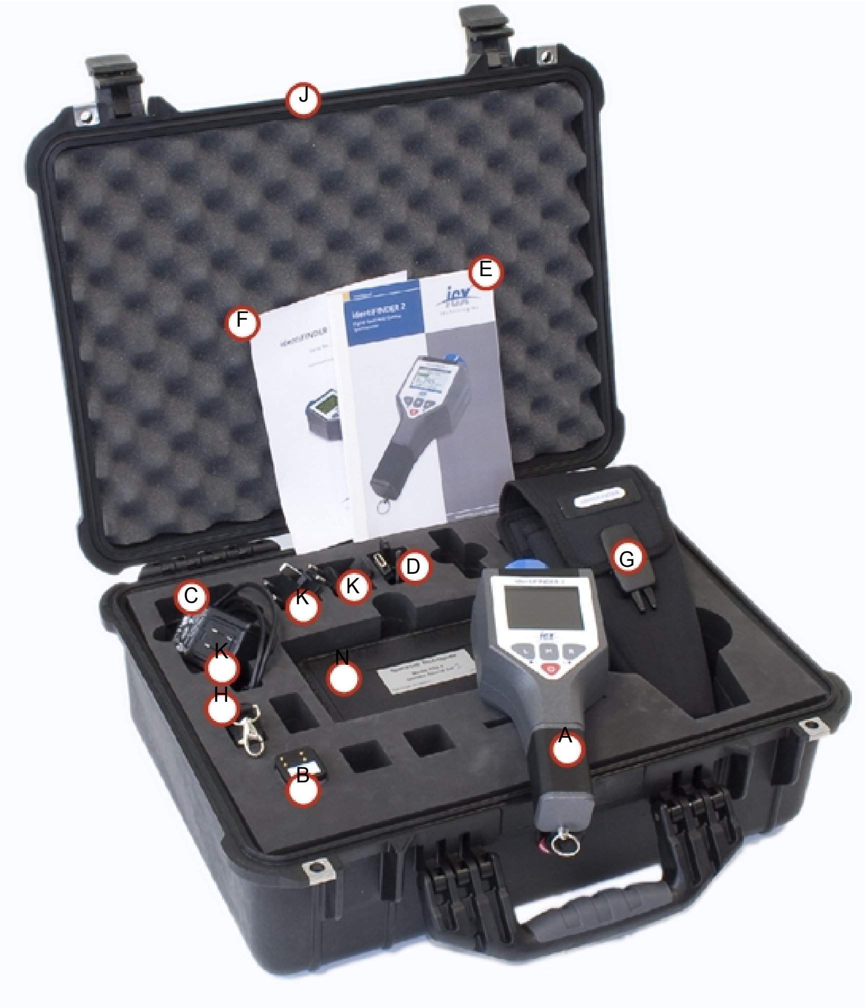
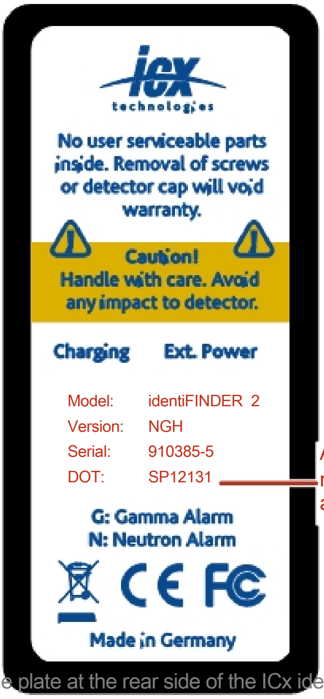

J
E
F
G
D
K
K
C
K
N
K
H
A
B

Figure 3. The ICx identiFINDER 2 with accessories in Pelican carrying case.


icx
technologies
No user serviceable parts inside. Removal of screws or detector cap will void warranty.
Caution!
Handle with care. Avoid any impact to detector.
Charging
Ext. Power
Model: identiFINDER 2
Version: NGH
Serial: 910385-5
DOT: SP12131
G: Gamma Alarm
N: Neutron Alarm
Made in Germany

Available only for models equipped with a neutron detector.

Figure 4. Name plate at the rear side of the ICx identiFINDER 2.

1.7 INSTRUMENT DESCRIPTION AND APPLICATION OVERVIEW

The ICx identiFINDER 2 can be described as a small but powerful computer with keyboard and LCD screen further equipped with dedicated detectors for gamma and neutron radiation plus some auxiliary sensors such as a receiver for the NAVSTAR global positioning system (GPS). All data acquired by the sensors are recorded, processed and evaluated by a sophisticated software that discriminates innocent from threatening radiation even if operated by personnel with minimal training.

A general outline of the ICx identiFINDER 2's functional elements is given in Figure 5, p. 12, while Figures 6-7, p. 13-13 helps to identify and locate the various components of the instrument.

- A micro computer shown in the center of Figure 5, p. 12 is the central element of the ICx identiFINDER 2. It is connected to various peripherals for input, output, and communication.
- Green circles in the upper left part of Figure 5, p. 12 represent input peripherals including the four-key " keyboard" and, most prominently, the three sensors for radioactive radiation:
  - A scintillation crystal to record gamma radiation spectra
  - A Geiger-Müller tube for dose and dose rate measurements - A ^{3}He detector for neutron radiation (optional)
- Output of the ICx identiFINDER 2 is directed mainly to the screen plus some status lights, a beeper, and a vibrator symbolized by blue circles in Figure 5, p. 12.
- The light gray circles in Figure 5, p. 12 represent elements accessible from the outside of the instrument like the battery pack and communication facilities.

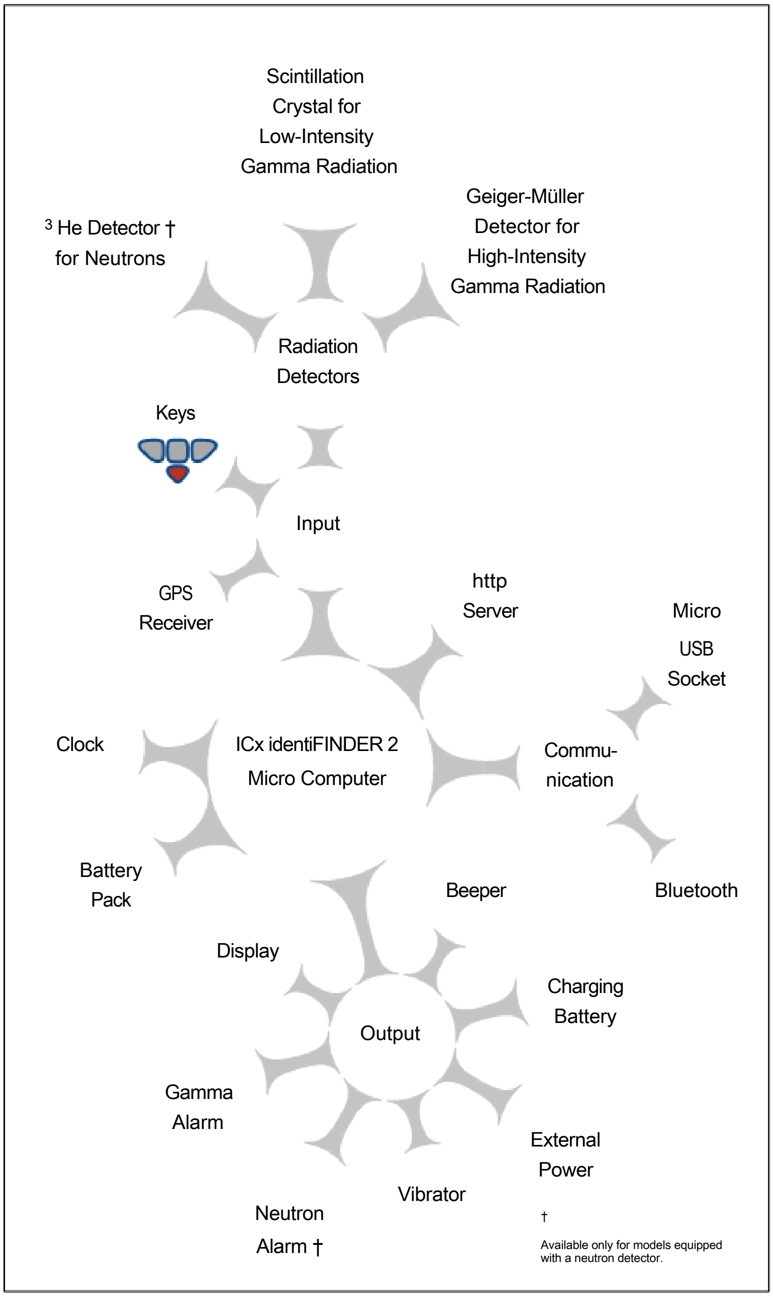

Scintillation Crystal for Low-Intensity Gamma Radiation
Geiger-Müller Detector for High-Intensity Gamma Radiation
³ He Detector † for Neutrons
Radiation Detectors
Keys
Input
GPS Receiver
http Server
Micro USB Socket
Clock
ICx identiFINDER 2 Micro Computer
Commu-nication
Battery Pack
Beeper
Bluetooth
Display
Charging Battery
Output
Gamma Alarm
External Power
Neutron Alarm †
Vibrator
† Available only for models equipped with a neutron detector.

Figure 5. Functional units of the ICx identiFINDER 2 (see text).

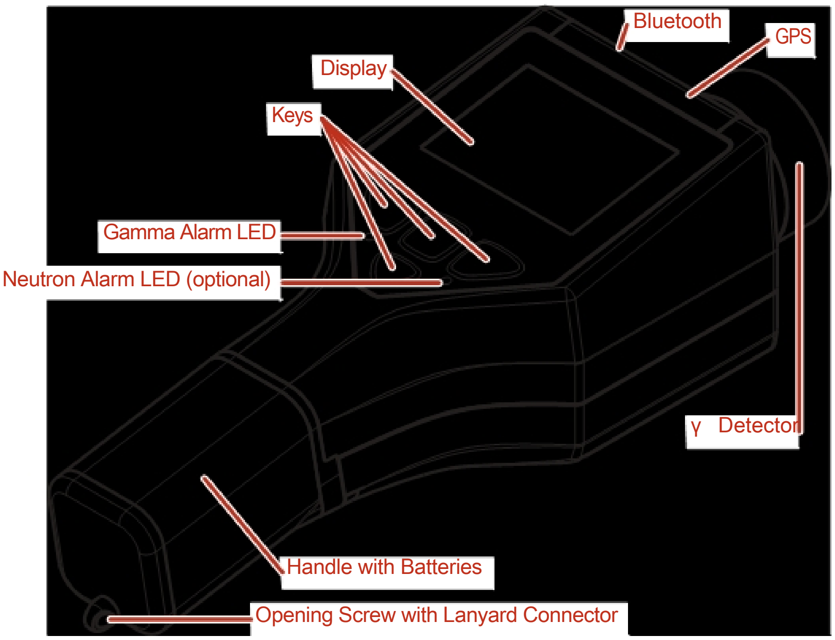

Bluetooth
GPS
Display
Keys
Gamma Alarm LED
Neutron Alarm LED (optional)
γ Detector
Handle with Batteries
Opening Screw with Lanyard Connector

Figure 6. Map of the ICx identiFINDER 2 components (front view).

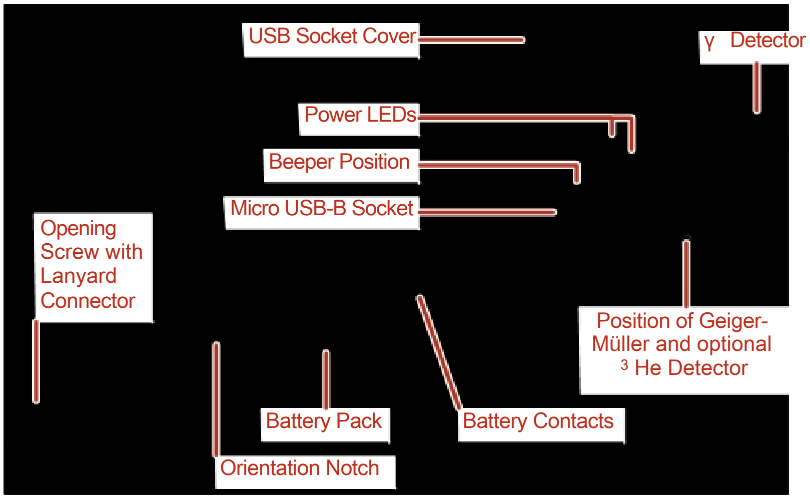

USB Socket Cover
γ Detector
Power LEDs
Beeper Position
Micro USB-B Socket
Opening Screw with Lanyard Connector
Position of Geiger-Müller and optional ³He Detector
Battery Pack
Battery Contacts
Orientation Notch

Figure 7. Map of the ICx identiFINDER 2 components (rear view).

2 Operating the ICx identiFINDER 2

The ICx identiFINDER 2 is optimized for single-handed operation (see Figure 8, p. 15). The detector should point to the object to be surveyed while you watch the display and control the instrument by pressing the keys with your thumb.

The fundamental principle of operation is to choose one of the available options and then execute the associated command or function.

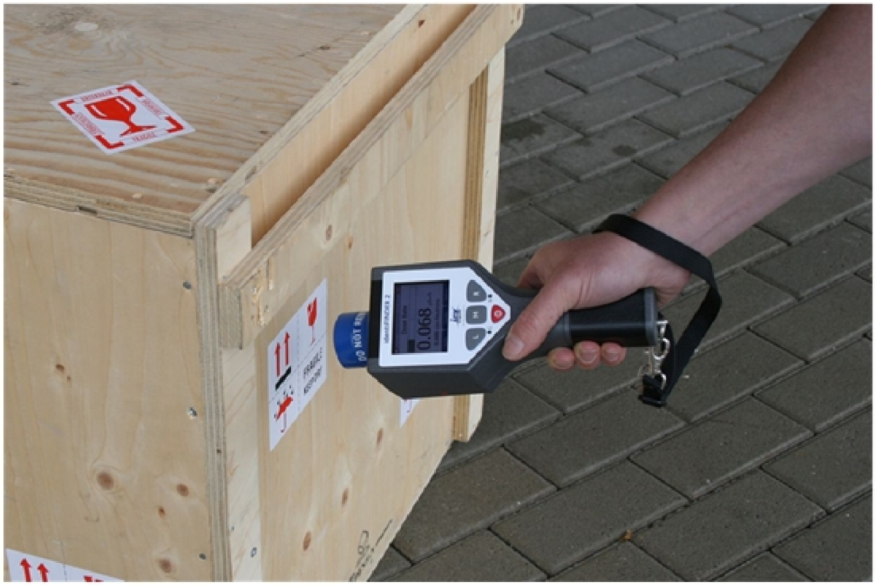


Figure 8. Surveying an object with the ICx identiFINDER 2.

2.1 THE ICx identiFINDER 2 DISPLAY

The ICx identiFINDER 2 display consists of a color LCD screen and 2 LEDs below the screen (Figure 9, p. 16). The screen is divided in three principle areas:

TOP: Title and Status Bar

This area contains a brief title of the currently performed operation or the current mode the instrument is switched to and some icons representing the status of several components of the instrument.

When a warning or an alarm is raised, the alarm information is shown alternating with the title (see, for example, Figure 76, p. 65).

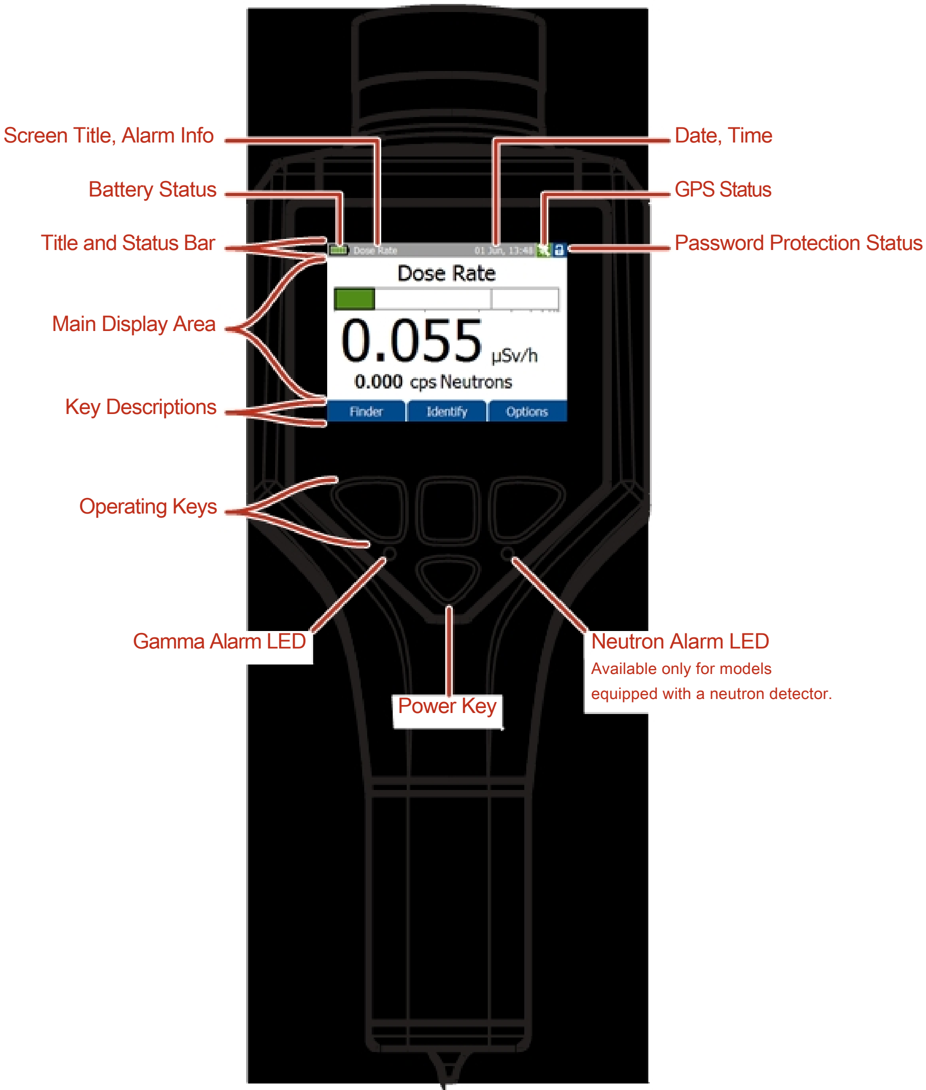

Screen Title, Alarm Info
Battery Status
Title and Status Bar
Main Display Area
Key Descriptions
Operating Keys
Gamma Alarm LED
Power Key
Date, Time
GPS Status
Password Protection Status
Neutron Alarm LED
Available only for models
equipped with a neutron detector.
Dose Rate
01 Jun, 13:48
Dose Rate
0.055 μSv/h
0.000 cps Neutrons
Finder
Identify
Options

Figure 9. ICx identiFINDER 2 Operating elements: Display, LEDs and keys.

The power indicator and the title are grouped in the left part of the bar.

Full battery

Empty or no battery

Triangles symbolize the connection to an external power supply. This information is also shown by a green LED on the back side of the instrument (see 8.6, p. 212).

A segment flickers while the battery is being charged. This information is also shown by a yellow LED on the back side of the instrument (see 8.6, p. 212).

The current date and time and indicators for the GPS receiver and the password protection are grouped in the right part of the title bar.

17 Dec, 13:13

The current local date and time are shown as day, month, hours (24-hour notation) and minutes.

The time is supplied by the clock built into the ICx identiFINDER 2. It uses UTC (a.k.a. “ Greewich Time”) for internal purposes and for time-stamping records saved in the database, for example, spectra or identification results.

For correct values you have to ensure the correct setting of the clock and the correct specification of your local time zone (see 4.16, p. 97).

The correct time and date can be set using the GPS receiver built into the ICx identiFINDER 2. If it is switched on (see 4.18, p. 100), it adjusts the clock to the high-precision UTC time received from the GPS satellites. All you have to specify is your local time zone (see 4.16, p. 97).

If the the internal clock is completely off, for example after storing the instrument with empty batteries for a couple of weeks, you have to adjust the internal clock and specify the time zone (see 4.16, p. 97).

A satellite symbolizes the state of the GPS receiver.

GPS receiver is switched off (factory setting, 4.18, p. 100).

GPS receiver is switched on (4.18, p. 100) but the GPS reception is not good enough to determine the current position. Invalid coordinates, marked as such, are saved.

GPS receiver is switched on (4.18, p. 100) and the GPS reception is sufficient to determine the current position which is saved with measurement data and identification results.

An unlocked or locked padlock shows whether you currently have access to those commands and settings which might be protected by a password (see 4.6, p. 73 and 4.5.2, p. 69). If a password is set, you can access the protected items after entering the password until you switch off the instrument.

CENTER: Variable Main Display

The contents of this area vary with the current operation of the ICx identiFINDER 2.

It shows, for example, status information after power up (Figure 34, p. 32), menus to choose commands from (Figure 11, p. 20), the strength of the observed gamma radiation (Figure 65, p. 54), or corresponding alarms (Figure 77, p. 66).

BOTTOM: Key Descriptions

This bar comprises three fields aligned above the operating keys M R naming the current function of each key.

2.2 THE ICx identiFINDER 2 KEYS

The ICx identiFINDER 2 is equipped with four keys located below the display above the handle of the instrument (Figure 6, p. 13 and Figure 9, p. 16). You can operate these keys with your thumb while holding the instrument.

Pressing a key triggers a feedback sound which you can switch off (4.17, p. 99).

The single key at the bottom is the power key ●. It is used to switch the instrument on and off, to cancel edit operations or return to superior menus.

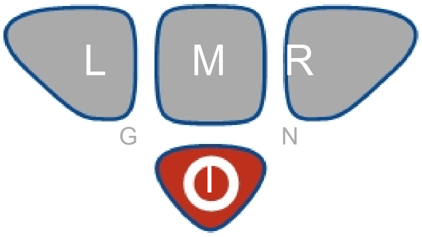


Figure 10. The ICx identiFINDER 2 “keyboard” with alarm LEDs

A red LED labeled “G” (short for “Gamma”) indicates dose and dose rate alarms. If your model is equipped with a neutron detector, a blue LED labeled “N” (short for “Neutron”) indicates neutron counts and alarms. You can switch off both LEDs (4.41, p. 138).

Three keys labeled L M R (short for “Left”, “Middle”, “Right”) form a row below the display. These keys change their function according to the current mode of operation of the ICx identiFINDER 2.

For your convenience, the actual function of these keys in any given situation is displayed in the bottom part of the screen (Figure 9, p. 16). A detailed description of the keys’ functions under various circumstances is given in chapter 4, p. 53.

Some operations, however, are common to almost all situations, so you will find the same functions for the three principal keys quite often when operating the ICx identiFINDER 2.

The commands Down, Select, and Exit help you to navigate the ICx identiFINDER 2’s menus and commands (2.2.1, p. 20).

Use the commands +, Accept, and - to choose from a list of options or to enter values (2.2.3, p. 23).

2.2.1 CHOOSING FROM MENUS

Often you have to choose an operation from a menu like, for example, the More Options menu shown (Figure 11, p. 20).

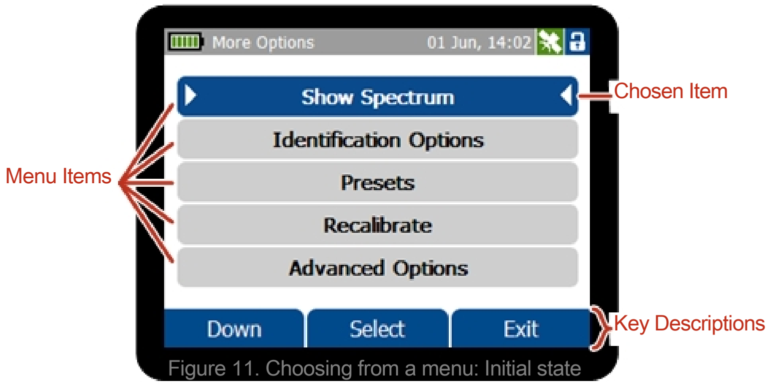

More Options
01 Jun, 14:02
Show Spectrum
Identification Options
Presets
Recalibrate
Advanced Options
Down
Select
Exit
Chosen Item
Menu Items
Key Descriptions

Figure 11. Choosing from a menu: Initial state

A menu shows several items, one of which is the chosen item decorated by distinct color and symbols. After opening a menu, the top most item is chosen. You can choose other items from the menu with the command Down mapped to the L key (Figure 12, p. 20).

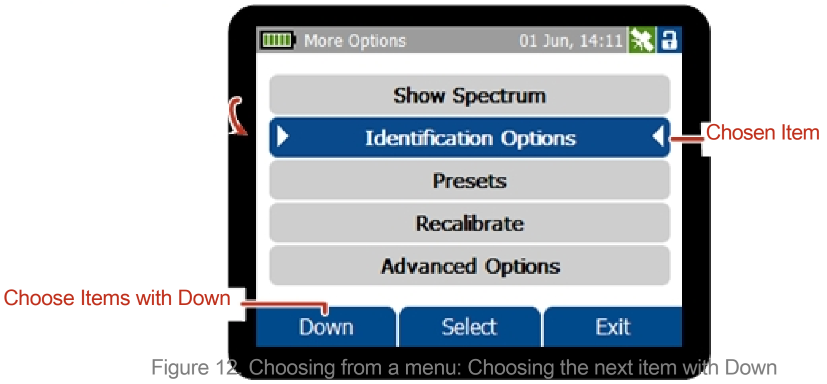

More Options
01 Jun, 14:11
Show Spectrum
Identification Options
Presets
Recalibrate
Advanced Options
Down
Select
Exit
Chosen Item
Choose Items with Down

Figure 12. Choosing from a menu: Choosing the next item with Down

Press L repeatedly to choose other menu items (Figure 13, p. 21).

After reaching the bottom of the menu (Figure 13, p. 21), the top item will be chosen on the next press of

Once you have chosen the item you are interested in, you can Select

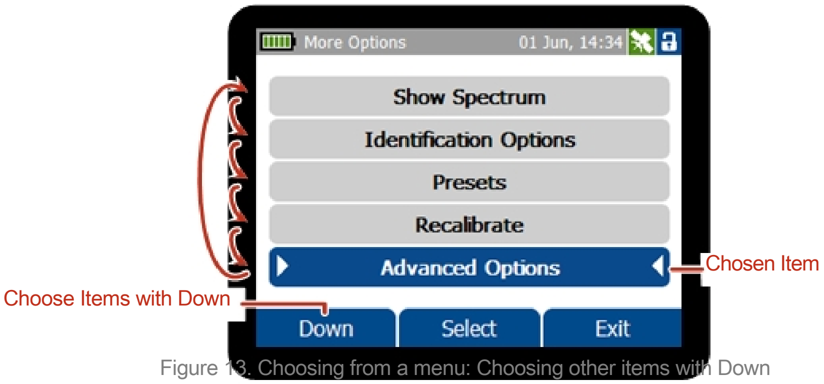

More Options
01 Jun, 14:34
Show Spectrum
Identification Options
Presets
Recalibrate
Advanced Options
Chosen Item
Choose Items with Down
Down
Select
Exit

Figure 13. Choosing from a menu: Choosing other items with Down

the item with M. This executes the chosen command, which, in our example, opens the Advanced Options menu (Figure 14, p. 21).

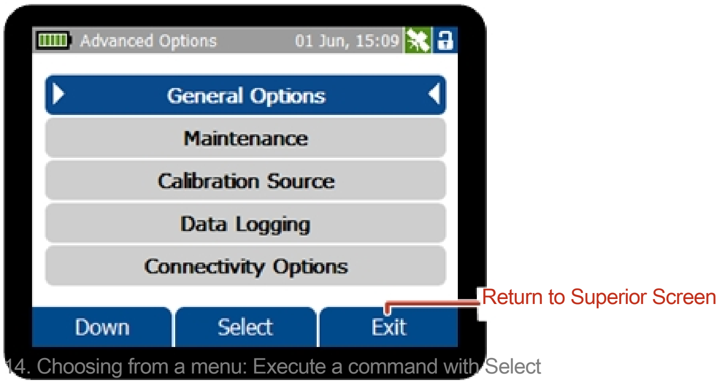

Advanced Options
01 Jun, 15:09
General Options
Maintenance
Calibration Source
Data Logging
Connectivity Options
Return to Superior Screen
Down
Select
Exit

Figure 14. Choosing from a menu: Execute a command with Select

Once you are done with a menu or command, press R to Exit to the superior screen which, in our example, opens the More Options menu (Figure 13, p. 21).

2.2.1.1 SCROLLING IN MENUS

Some menus offer more options than the five fitting on the screen. This is indicated by scroll bars along the vertical screen edges (Figure 15, p. 22).

A position marker indicates the position of the chosen item relative to the complete list of items. Arrows at the upper and lower visible item indicate whether more items are available in that direction, respectively.

If you approach the bottom of the screen with Down mapped to the L key, the entire menu is moved up to bring the following items into view. The position markers are adjusted appropriately.

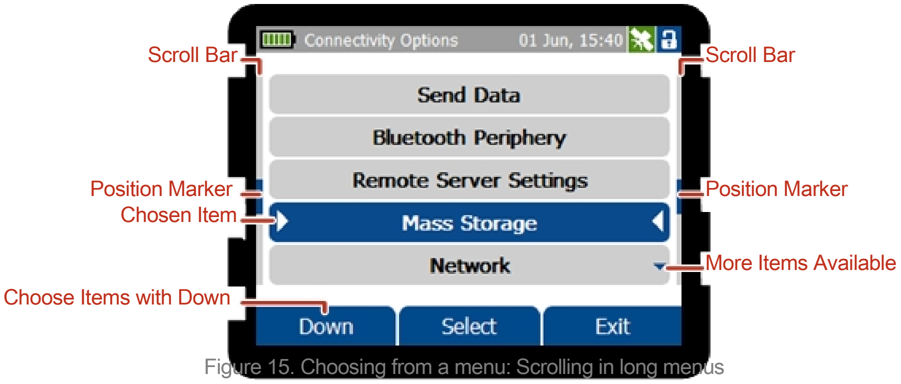

Connectivity Options
01 Jun, 15:40
Send Data
Bluetooth Periphery
Remote Server Settings
Mass Storage
Network
Down
Select
Exit
Scroll Bar
Scroll Bar
Position Marker
Chosen Item
Position Marker
More Items Available
Choose Items with Down

Figure 15. Choosing from a menu: Scrolling in long menus

2.2.2 USING COMMAND LISTS

You saw above how to operate the ICx identiFINDER 2's menus with only three keys. Some features of the ICx identiFINDER 2, however, need more commands than you could immediately reach with the ICx identiFINDER 2's limited number of keys.

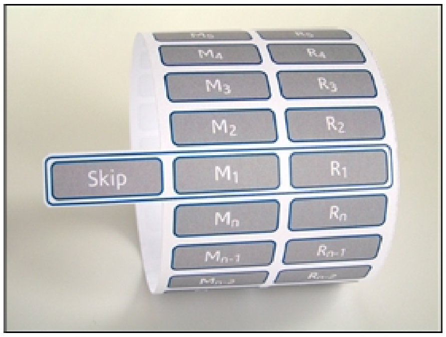

M4
R4
M3
R3
M2
R2
Skip
M1
R1
Mn
Rn
Mn-1
Rn-1

Figure 16. Skipping command pairs in a long list of commands

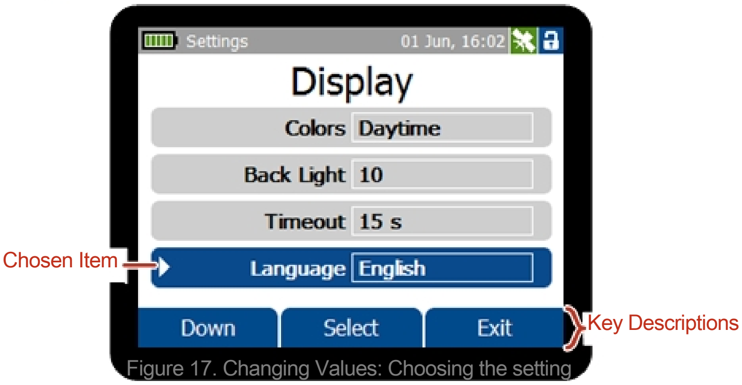
In these cases all commands are grouped into pairs mapped to M and R, respectively.

The special command Skip is permanently mapped to and you can use it to cycle the pairs of normal commands. If you reach the end of the list, L cycles to the start of the list (Figure 16, p. 22).

2.2.3 CHANGING VALUES

Many settings of your ICx identiFINDER 2 require you to choose from a small (half a dozen items) list of options, others require a value with thousands of variants. Although the number of keys is limited, the smart input method of the ICx identiFINDER 2 makes changing even large values a breeze.

The operations are illustrated using the Display Settings as an example. Like in a menu (2.2.1, p. 20), you choose the setting you want to change with Down (Figure 17, p. 23).



Display

Colors Daytime

Back Light 10

Timeout 15 s

Language English

Figure 17. Changing Values: Choosing the setting

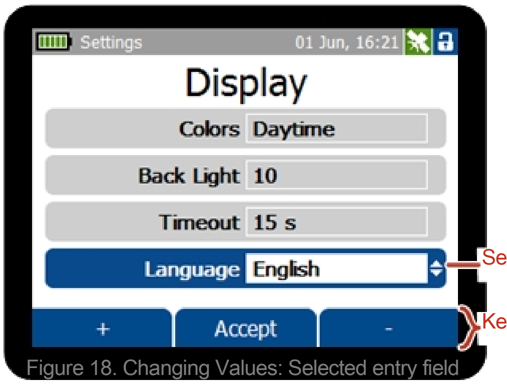
Once the desired setting is chosen, you Select it with M.

The rendering of the entry field changes (Figure 18, p. 24): a different color and two arrows indicate there is a list of values you can choose from.

Note that the keys now have other functions. You get the next item in the list with + mapped to L and the previous one with - mapped to R.

Our example is about the display language, so let's use L or R to change to, for example, Deutsch (German, Figure 19, p. 24).

The actual setting did not change yet, the screen is still displayed in English. You can choose other values with + or - ad lib. The moment you



Settings 01 Jun, 16:21

Display

Colors Daytime

Back Light 10

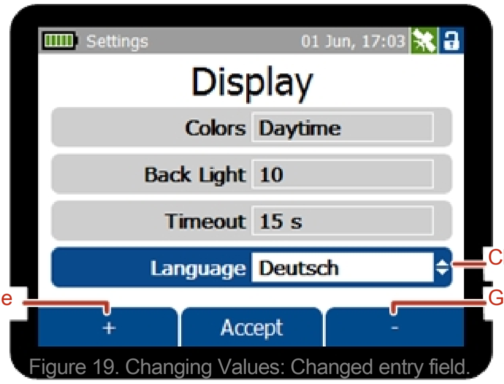
Timeout 15 s

Language English

Selected Entry Field

Key Descriptions

Figure 18. Changing Values: Selected entry field



Settings 01 Jun, 17:03

Display

Colors Daytime

Back Light 10

Timeout 15 s

Language Deutsch

Changed Value

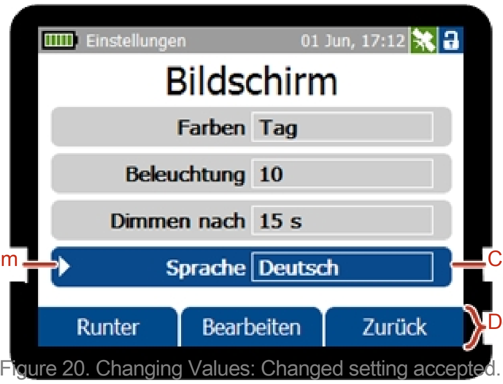
Go to Next Value

Go to Previous Value

Figure 19. Changing Values: Changed entry field.

press Accept mapped to M, the new setting takes effect. In our case the screen is displayed in German (Figure 20, p. 24).

The keys' functions return to their previous state.



Einstellungen 01 Jun, 17:12

Bildschirm

Farben Tag

Beleuchtung 10

Dimmen nach 15 s

Sprache Deutsch

Chosen Item

Changed Value Accepted

Down, Select, Exit

Figure 20. Changing Values: Changed setting accepted.

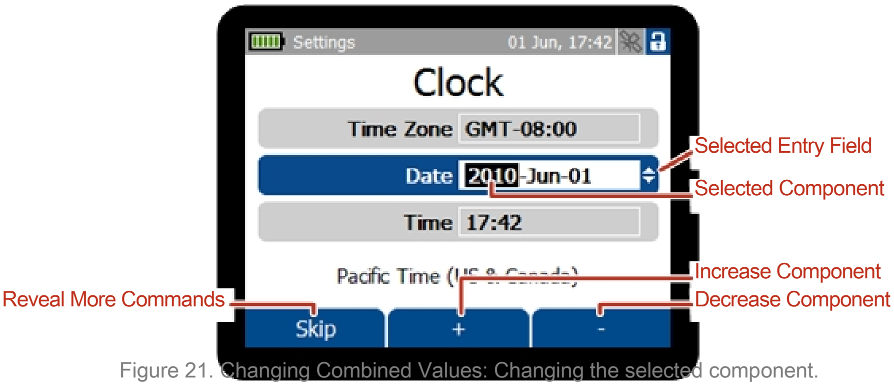
In case you change your mind, you can cancel editing the value by pressing for a moment. The value in effect before you started editing with Select will be reestablished.

⚠ Do not press for too long. That would power down your ICx identiFINDER 2.

2.2.4 CHANGING COMPOSITE VALUES

Some values are combinations of several components. Calendar dates for example, have year, month, and day components or clock settings have hours and minutes components.

Several commands are available if you Select (see 2.2.3, p. 23) such values for editing. Always one of the value's components is selected (Figure 21, p. 25), that is, editing commands are applied to this component.



Settings 01 Jun, 17:42

Clock

Time Zone GMT-08:00

Date 2010-Jun-01

Time 17:42

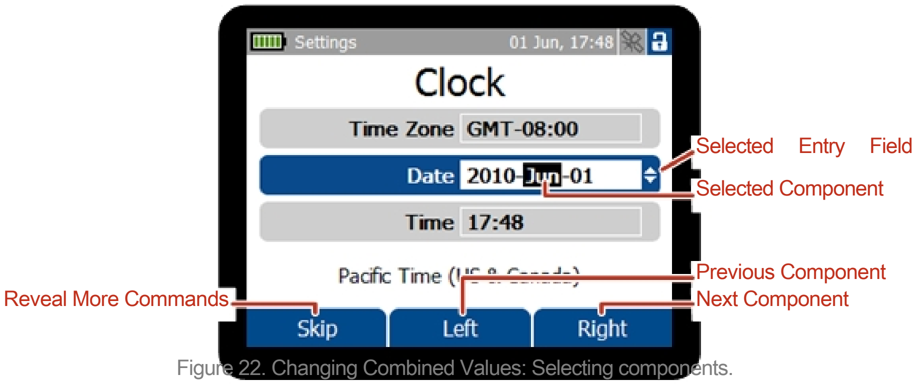
Pacific Time (US & Canada)

Figure 21. Changing Combined Values: Changing the selected component.

You increase the component with + mapped to and decrease it with - mapped to R. In the example shown here, you edit the year of the date since it is the selected component.

Now you need commands to select the other components of the value (see 2.2.2, p. 22). You can reveal them with Skip mapped to (Figure 22, p. 26).

Press Left mapped to M or Right mapped to R to select the component you want to edit.



Settings 01 Jun, 17:48

Clock

Time Zone GMT-08:00

Date 2010-Jun-01

Time 17:48

Pacific Time (US & Canada)

Figure 22. Changing Combined Values: Selecting components.

To get the commands for editing back, press Skip until + and - reappear.

After you are finished editing all components, press Skip until you see the Accept command mapped to .

In case you change your mind, you can cancel editing the value by pressing ⏻ for a moment. The value in effect before you started editing with Select will be reestablished.

⚠ Do not press ⏻ for too long. That would power down your ICx identiFINDER 2.

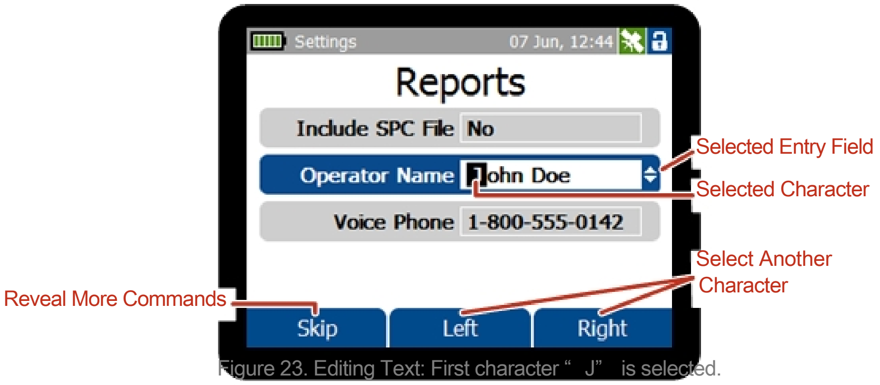
2.2.5 ENTERING TEXT

Several entries consist of arbitrary text, for example the operator's name, phone numbers, or settings for Bluetooth communication to a remote server (Figure 147, p. 127). Entering and editing text with the ICx identiFINDER 2's limited number of keys is, of course, challenging. It is similar to editing composite values as described in 2.2.4, p. 25, with every character being a component.

💡 Editing text is a lot more convenient via the ICx identiFINDER 2's web interface (see 6, p. 159).

Several commands are available if you Select (see 2.2.3, p. 23) text values for editing. These commands are mapped to the keys and Use Skip mapped to to cycle through the available commands (see 2.2.2, p. 22).

During text editing, exactly one character is selected (Figure 23, p. 27), that is, editing commands are applied to this character.


Settings
07 Jun, 12:44
Skip
Left
Right
Selected Entry Field
Selected Character
Select Another Character
Reveal More Commands

Reports

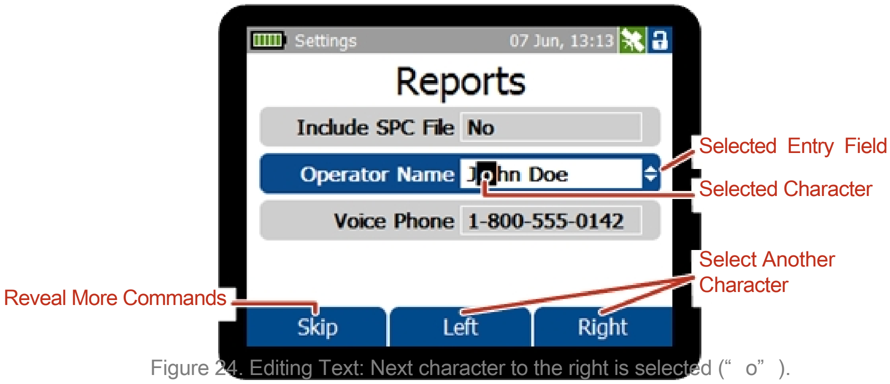
Include SPC File No

Operator Name John Doe

Voice Phone 1-800-555-0142

Figure 23. Editing Text: First character “ J” is selected.

To select another character, use Left or Right (Figure 24, p. 27).


Settings
07 Jun, 13:13
Skip
Left
Right
Selected Entry Field
Selected Character
Select Another Character
Reveal More Commands

Reports

Include SPC File No

Operator Name John Doe

Voice Phone 1-800-555-0142

Figure 24. Editing Text: Next character to the right is selected (“ o”).

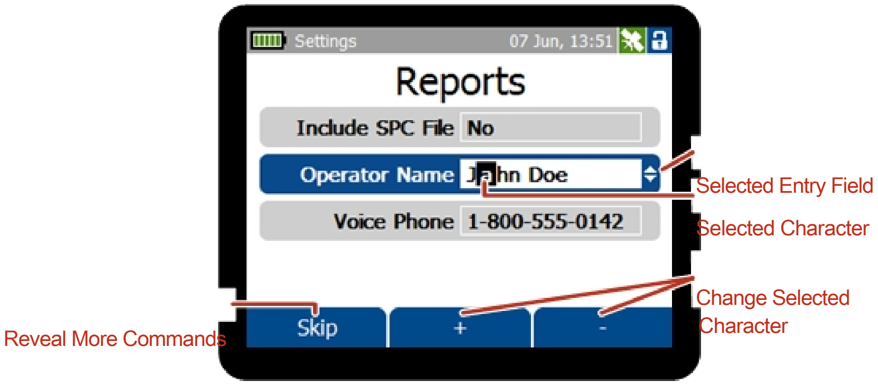
If you reach the left end of the text, Left does nothing. At the end of the text, however, Right moves to two additional characters (spaces) to facilitate appending another word to the text.

For the selected character (Figure 26, p. 28), you can use the commands + and - to cycle through the available characters in the sequence shown in Figure 25, p. 28.

Use the web interface (see 6, p. 159) to enter international characters like æ, î, ö, ñ, ß, ëtç.

!"§$%&/()[]{}=?*+#’-_@.:,;
0123456789
(Space)
abcdefghijklmnopqrstuvwxyz
ABCDEFGHIJKLMNOPQRSTU
VWXYZ

Figure 25. Editing Text: Set of available characters


Settings
07 Jun, 13:51
Reports
Skip
+
-
Selected Entry Field
Selected Character
Change Selected Character
Reveal More Commands

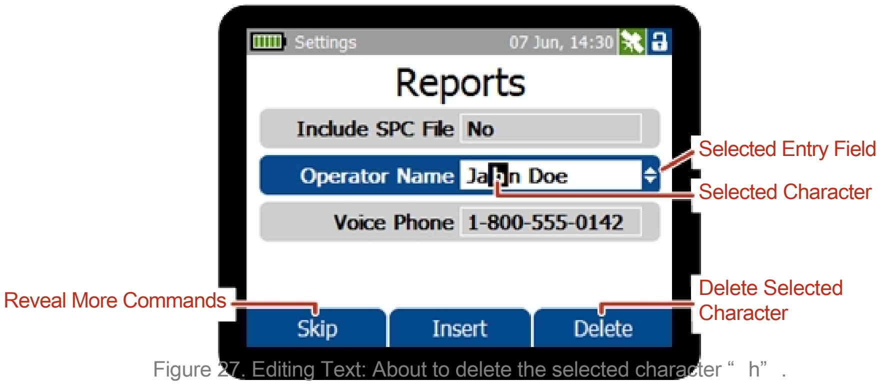
Include SPC File No
Operator Name Jahn Doe
Voice Phone 1-800-555-0142

Figure 26. Editing Text: After changing the selected “ o” to an “ a” .

To delete the selected character use (Figure 27, p. 29). The characters from the selected one to the end of the text will be moved towards the beginning to fill the gap (Figure 28, p. 29).

To insert a character before the currently selected character, use . The existing characters, including the selected one, are pushed one position towards the end of the text (Figure 29, p. 29).

After you finished editing the text, press until you see the command and press (Figure 30, p. 30).

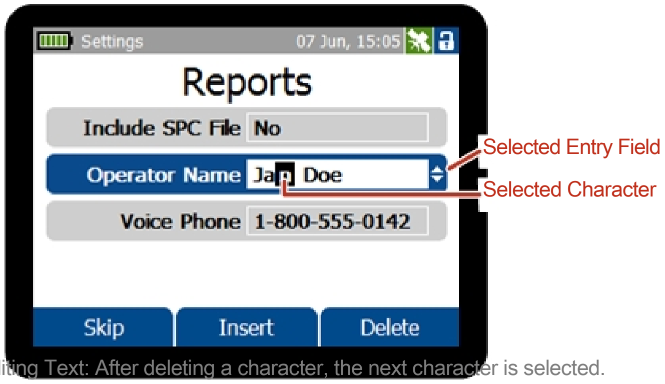

Settings
07 Jun, 14:30
Skip
Insert
Delete

Reports

Include SPC File No
Operator Name Jahn Doe
Voice Phone 1-800-555-0142

Selected Entry Field
Selected Character
Reveal More Commands
Delete Selected Character

Figure 27. Editing Text: About to delete the selected character “ h” .

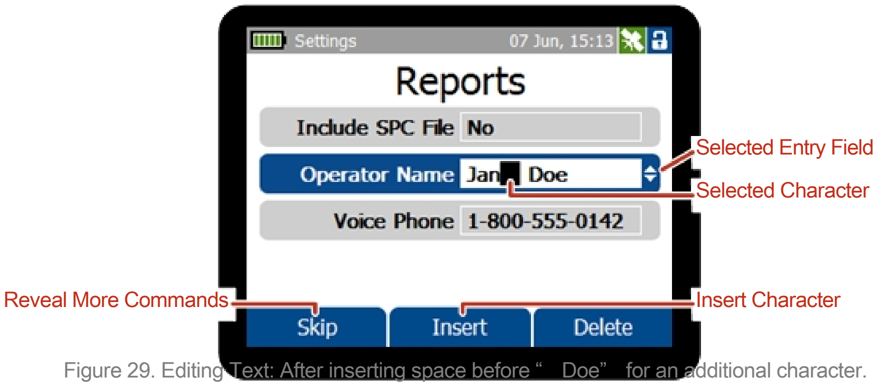

Settings
07 Jun, 15:05
Skip
Insert
Delete

Reports

Include SPC File No
Operator Name Jan Doe
Voice Phone 1-800-555-0142

Selected Entry Field
Selected Character

Figure 28. Editing Text: After deleting a character, the next character is selected.


Settings
07 Jun, 15:13
Skip
Insert
Delete

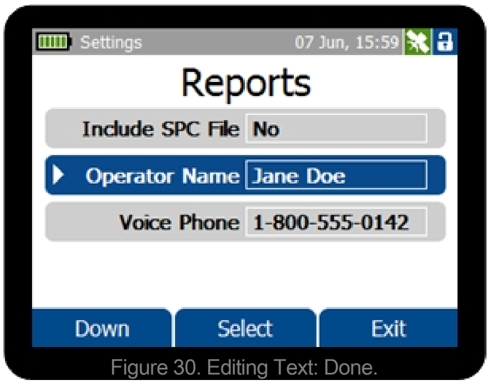
Reports

Include SPC File No
Operator Name Jan Doe
Voice Phone 1-800-555-0142

Selected Entry Field
Selected Character
Reveal More Commands
Insert Character

Figure 29. Editing Text: After inserting space before “ Doe” for an additional character.

Spaces at the start or end of the text, if any, are removed from your entry.



Reports

Include SPC File: No

Operator Name: Jane Doe

Voice Phone: 1-800-555-0142

Figure 30. Editing Text: Done.

In case you change your mind, you can cancel editing the value by pressing ⏻ for a moment. The value in effect before you started editing with Select will be reestablished.

⚠ Do not press ⏻ for too long. That would power down your ICx identiFINDER 2.

2.2.6 TAKING SCREENSHOTS

You can save the contents of the ICx identiFINDER 2's display at any time.

➜ To take a screenshot. . .

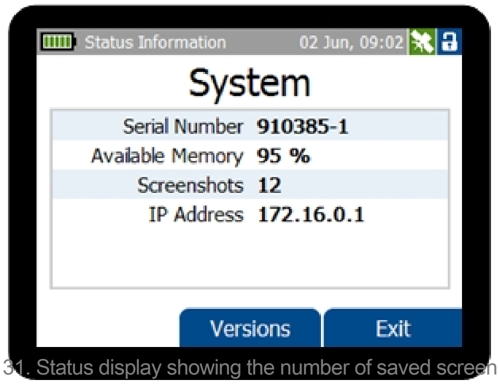
1. Press and hold ⏻
2. Press L.

   ⚠ Do not wait to long between pressing ⏻ and L, otherwise you might initiate the power down command (2.4, p. 33).

Screenshots are saved in the ICx identiFINDER 2's permanent memory as image files named after the screen taken suffixed by the current date, time and time zone offset.

To access the saved screenshots, connect your ICx identiFINDER 2 to a computer (see 5.2, p. 148 or 6.15, p. 189).

You can check the number of saved screenshots in the status display (4.21, p. 103, Figure 31, p. 31) or erase them (4.26, p. 109).



Status Information 02 Jun, 09:02

System

Serial Number	910385-1
Available Memory	95 %
Screenshots	12
IP Address	172.16.0.1

Figure 31. Status display showing the number of saved screenshots.

2.3 STARTING UP THE ICx identiFINDER 2

➔ To start up the ICx identiFINDER 2. . .

1. Ensure that the instrument is clean and free of visible damages.
2. Ensure that the battery is charged or connect the instrument to an external power source (see 8.6, p. 212)
3. Press and hold ⏻ for a moment.
   Thered LED above the power key flashes. If your model is equipped with a neutron detector, the blue LED flashes as well.
4. Release the key.
   Wait a moment while the ICx identiFINDER 2
   - Identifies itself (Figure 32, p. 31),

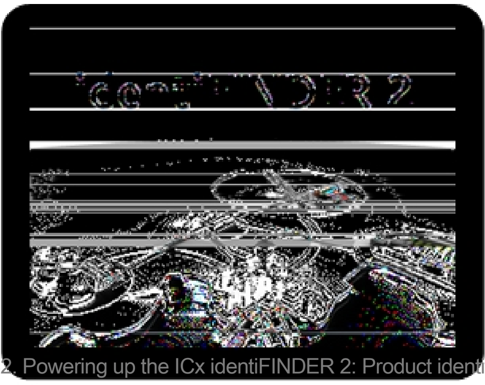


Figure 32. Powering up the ICx identiFINDER 2: Product identification

- goes through start-up procedures (Figure 33, p. 32),

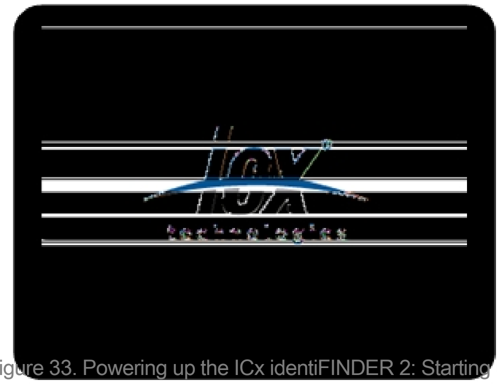
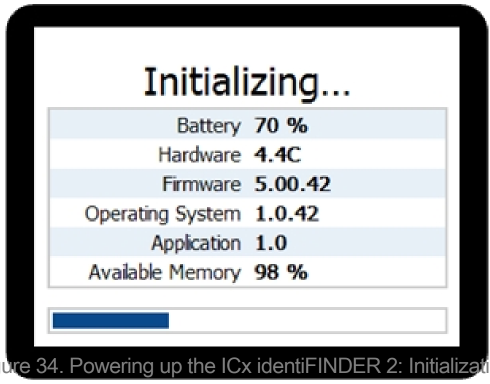


Figure 33. Powering up the ICx identiFINDER 2: Starting up

- initializes the software (Figure 34, p. 32).



Initializing...

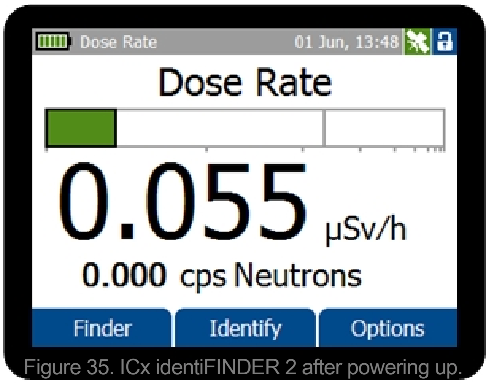
Battery	70 %
Hardware	4.4C
Firmware	5.00.42
Operating System	1.0.42
Application	1.0
Available Memory	98 %

Figure 34. Powering up the ICx identiFINDER 2: Initialization

⚠ If the time of the ICx identiFINDER 2's internal clock is unreasonable, most probably caused by the battery pack being empty for some weeks, you will be asked to set the clock (see 4.16, p. 97).

⚠ If your ICx identiFINDER 2 has no built-in calibration source, ensure the appropriate external source is in front of the detector to allow a proper start-up calibration (see 4.28, p. 111).

5. The ICx identiFINDER 2 switches to the dose rate display (Figure 35, p. 33) and is ready for operation.



Dose Rate 01 Jun, 13:48

Dose Rate

0.055 µSv/h

0.000 cps Neutrons

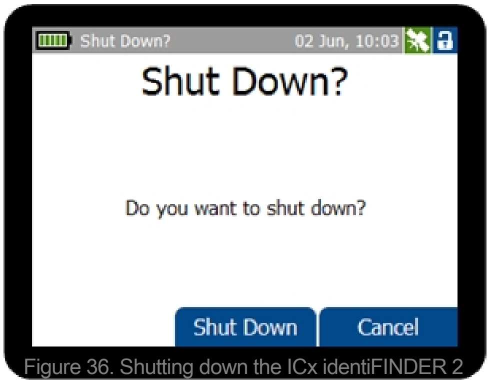
Figure 35. ICx identiFINDER 2 after powering up.

2.4 SHUTTING DOWN THE ICx identiFINDER 2

Several methods are available to shut down the ICx identiFINDER 2.

➔ To shut down the ICx identiFINDER 2 normally. . .

1. Press and hold ◉
   After a couple of seconds, the shut down screen will be displayed (Figure 36, p. 33).



Shut Down? 02 Jun, 10:03

Shut Down?

Do you want to shut down?

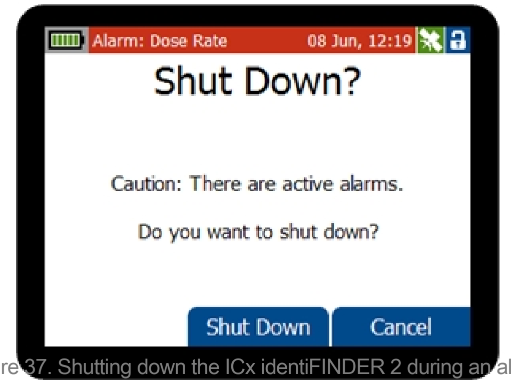
Figure 36. Shutting down the ICx identiFINDER 2

2. Press M to confirm the shut down command.

or Keep ◉ depressed and the ICx identiFINDER 2 will shut down.

or Press R to cancel the shut down and resume normal operation.

⚠ If you shut down the ICx identiFINDER 2 while an alarm is raised (Figure 37, p. 34), the end time of the alarm entry is not stored in the database (4.4, p. 64). Instead, the end time will reflect that the instrument was shut down before the end of the alarm.



Shut Down?

Caution: There are active alarms.

Do you want to shut down?

Figure 37. Shutting down the ICx identiFINDER 2 during an alarm

➔ To shut down the ICx identiFINDER 2 in case of software failure. . .

1. Press and hold ⏻ for about 20 seconds until the red LED and the beeper emit six short and one long signal.

   If key tones are off (4.17, p. 99), the beeper remains silent. The ICx identiFINDER 2 should shut down.

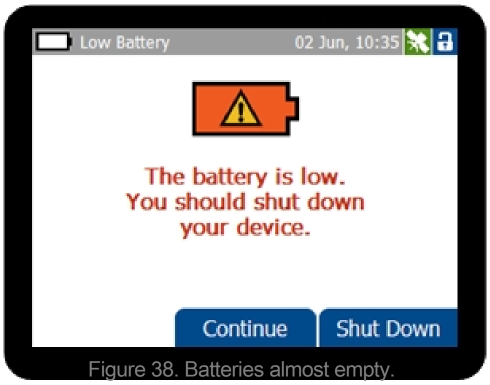
2. If this doesn't work, unplug the USB cable (see 5.1, p. 146), if any, and remove the handle containing the batteries (Figures 219-220, p. 208-209).

2.5 LOW POWER CONDITIONS

When the battery runs out of power, an appropriate warning will be displayed (Figure 38, p. 35) accompanied by a characteristic sound (Figure 39, p. 35).

You can Shut Down with R or Continue using the ICx identiFINDER 2 with M until the batteries are completely empty, however, the only operation available is a limited dose rate mode (Figure 40, p. 35 and 4.1, p. 54).

If the batteries are completely empty, another message (Figure 41, p. 36) will appear accompanied by a characteristic sound (Figure 39, p. 35).


Low Battery
02 Jun, 10:35
Continue
Shut Down

The battery is low.
You should shut down
your device.

Figure 38. Batteries almost empty.

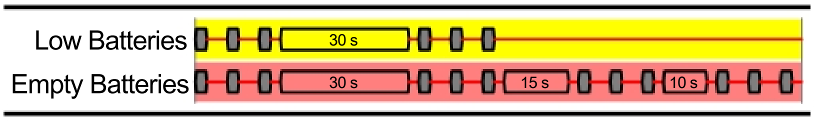
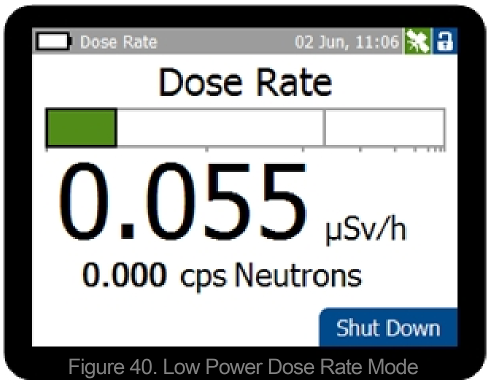

Low Batteries
30 s
Empty Batteries
30 s
15 s
10 s

Figure 39. Schematic timing of triple beeps indicating low power conditions.


Dose Rate
02 Jun, 11:06
Dose Rate
Shut Down

0.055 µSv/h
0.000 cps Neutrons

Figure 40. Low Power Dose Rate Mode

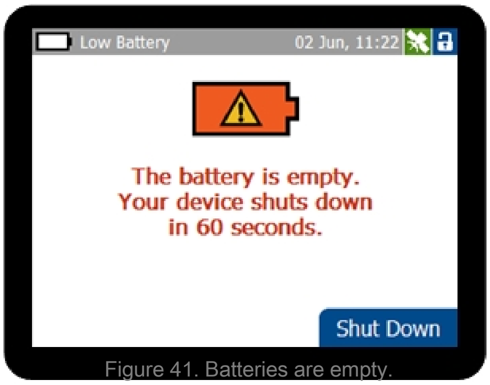
You should switch off the instrument.

Please connect the ICx identiFINDER 2 to an external power source (see 8.1, p. 201) or replace the batteries with fresh ones.

2.6 RESETTING THE ICx identiFINDER 2

The ICx identiFINDER 2 can be reset by performing a normal shut down-start up cycle.

All your custom settings remain unchanged by this proce-



The battery is empty.
Your device shuts down
in 60 seconds.

Figure 41. Batteries are empty.

dure. To revert the instrument to the factory defaults, use Reset Factory Settings (4.22, p. 107).

➔ To reset the ICx identiFINDER 2. . .

1. Shut down the instrument (2.4, p. 33)

   Should a reset be necessary because the instrument does not react to your input anymore, you might have to use the forced shut down procedure described in section 2.4, p. 33.

2. Start up the instrument (2.3, p. 31).

3 Field Operating Guide

This chapter provides a guide to the basic operating procedures necessary to survey an object and generate the analyzed results for the survey of that object.

In many cases, your organization or institution will have its own Standard Operating Procedure (SOP). In such a case, you should refer to that SOP.

A typical application of the ICx identiFINDER 2 is the survey of objects for radioactive radiation and to document the results of the survey. This process involves these fundamental steps:

1. Turn on and check the instrument (see 3.1, p. 38).
2. Observe the dose rate in your environment to detect gamma radiation (see 3.2, p. 39).
3. Locate the source of the radiation (see 3.3, p. 42).
4. Identify the nuclides that gamma radiation is originating from (see 3.4, p. 43).
5. Transfer the results to a local computer for further processing (see 3.5, p. 46).
6. Send the results to a remote service (see 3.6, p. 48).
7. Turn off the instrument (see 3.7, p. 51).

Please familiarize yourself with the names and positions of the ICx identiFINDER 2's parts and the general methods of operation (chapter 2, p. 15) before proceeding with this chapter.

Chapter 4, p. 53 provides information about all operations and describes the operations mentioned here in more detail. More precise pointers into the reference will be provided with the operation steps outlined below.

The instructions outlined in this chapter assume a model with a neutron detector (A.1, p. 231) and with factory settings.

3.1 SWITCHING ON AND CHECKING THE INSTRUMENT

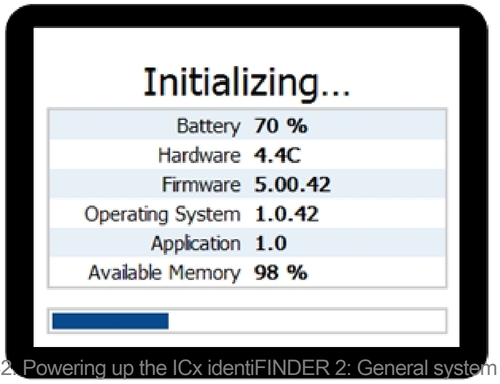
This description assumes normal operation of the instrument. For a detailed description of the startup procedure refer to section 2.3, p. 31.

➔ To start up the ICx identiFINDER 2. . .

1. Press and hold ⏻ for a moment until the screen backlight appears.
2. Release the key.

   Wait a moment while the ICx identiFINDER 2

   - identifies itself,
   - goes through start-up procedures,
   - initializes the software (Figure 42, p. 38).

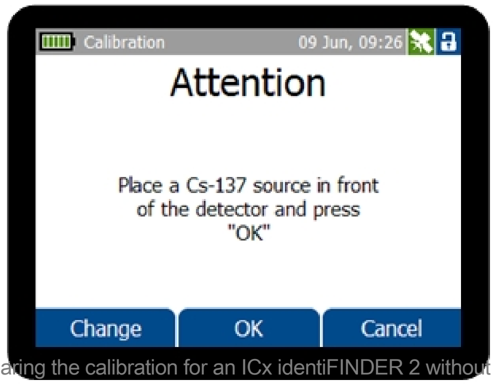


Initializing...

Battery	70 %
Hardware	4.4C
Firmware	5.00.42
Operating System	1.0.42
Application	1.0
Available Memory	98 %

Figure 42: Powering up the ICx identiFINDER 2: General system status

3. Verify if there is enough energy in the battery and available space in the memory (Figure 42, p. 38).
4. The instrument will initiate the calibration. If your model of the ICx identiFINDER 2 has no radiation source built in, you will be prompted (Figure 43, p. 39) to provide the calibration source (see 4.28, p. 111).
5. The ICx identiFINDER 2 switches to the dose rate display (Figure 44, p. 39) and is ready for operation.



Calibration 09 Jun, 09:26

Attention

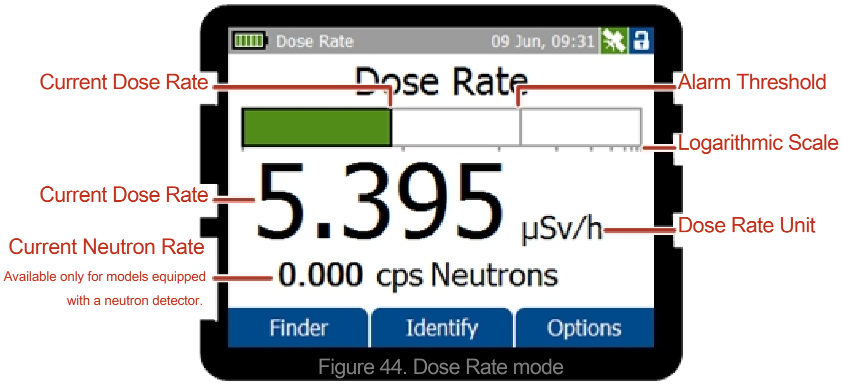
Place a Cs-137 source in front of the detector and press "OK"

Change
OK
Cancel

Figure 43. Preparing the calibration for an ICx identiFINDER 2 without internal source

3.2 OBSERVING THE ENVIRONMENT

The Dose Rate Mode (Figure 44, p. 39) is the basic operation mode of the ICx identiFINDER 2, please refer to 4.1, p. 54 for a detailed description.



Dose Rate 09 Jun, 09:31

Dose Rate

5.395 µSv/h

0.000 cps Neutrons

Current Dose Rate
Alarm Threshold
Logarithmic Scale
Current Dose Rate
Dose Rate Unit
Current Neutron Rate
Available only for models equipped with a neutron detector.
Finder
Identify
Options

Figure 44. Dose Rate mode

3.2.1 GAMMA RADIATION SURVEY

➔ To survey for gamma radiation. . .

1. Move the instrument around (e.g. Figure 45, p. 40) and observe the display (Figure 44, p. 39).

   The current dose rate is shown in large digits and as a bar chart.

   💡 You can change the dose rate unit (see 4.40, p. 137) and the alarm thresholds (see 4.42, p. 139).

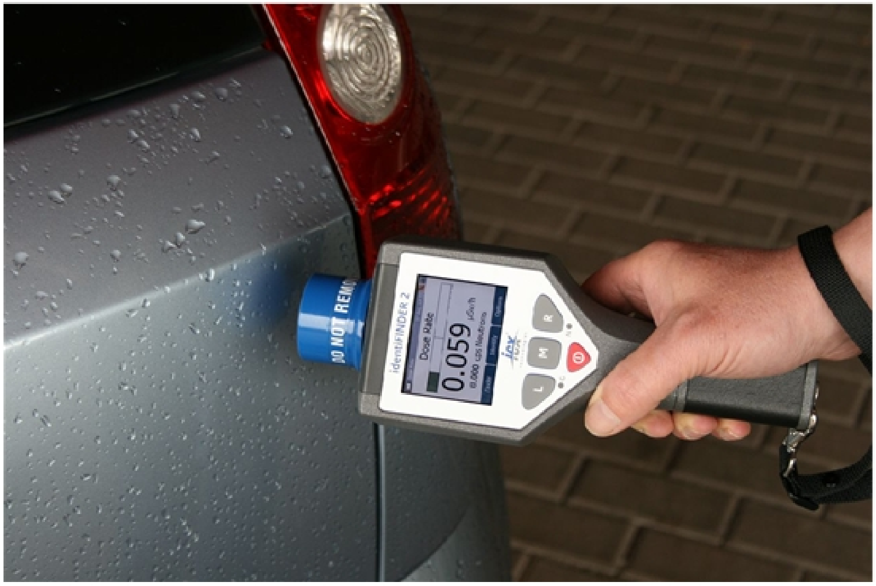
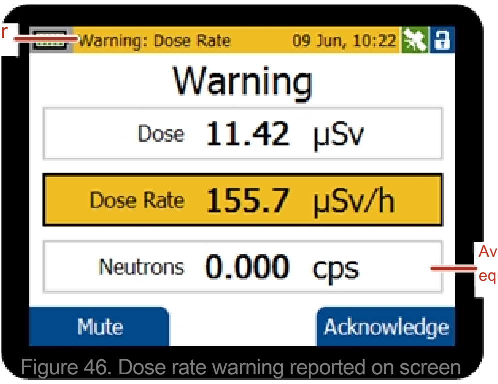


Figure 45. Surveying a car trunk with the ICx identiFINDER 2.

The ICx identiFINDER 2 continuously compares the radiation to warning and alarm thresholds (see 4.42, p. 139 ff). Should the radiation exceed one of the thresholds, the instrument raises an alarm which is reported on-screen (Figure 46, p. 40) and optionally by LEDs, beeper, and vibrator (see 4.4, p. 64 for details about the beep and vibration patterns).



Title Bar

Warning: Dose Rate 09 Jun, 10:22

Warning

Dose 11.42 µSv

Dose Rate 155.7 µSv/h

Neutrons 0.000 cps

Available only for models equipped with a neutron detector.

Figure 46. Dose rate warning reported on screen

You can press L Mute to silence alarm annunciation by beeper and vibrator. Press R Acknowledge after you took notice of the alarm or warning.

The alarm or warning will be reported in the title bar until the radiation drops below the appropriate threshold (Figure 46, p. 40).

3.2.2 NEUTRON RADIATION SURVEY

Available only for models equipped with a neutron detector.

➔ To survey for neutrons. . .

1. Increase the instrument's sensitivity for unmoderated neutrons by attaching the PE neutron moderator (10.2, p. 221).
2. Hold the ICx identiFINDER 2 close to your body so that the neutron detector (Figure 242, p. 236) is close to you (Figure 47, p. 41).

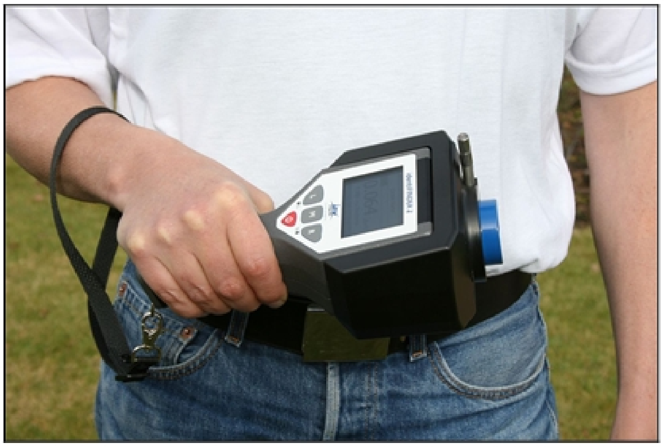


Figure 47. Optimum posture for neutron detection

3. Turn around 360° to detect the neutrons regardless of your location relative to the source.

⚠ For tests involving un-moderated neutron sources, a 30 cm × 30 cm × 15 cm PMMA phantom (Figure 235, p. 223) or equivalent must be placed between the source and the detector in the ICx identiFINDER 2 (Figure 242, p. 236) in order to provide adequate moderation of fast neutrons and to simulate the field operation instructions given here.

3.3 LOCATING A RADIATION SOURCE

Once you suspect the presence of a radiation source from observing the environment, you should use the ICx identiFINDER 2's Finder Mode (4.2, p. 57) to determine the exact location of the source.

➔ To locate a radiation source. . .

1. Move the instrument to a low-radiation position for a background measurement.
2. Press L Finder to switch from Dose Rate Mode to Finder Mode.
3. Wait until the ICx identiFINDER 2 finishes a 10-second background measurement (Figure 48, p. 42).

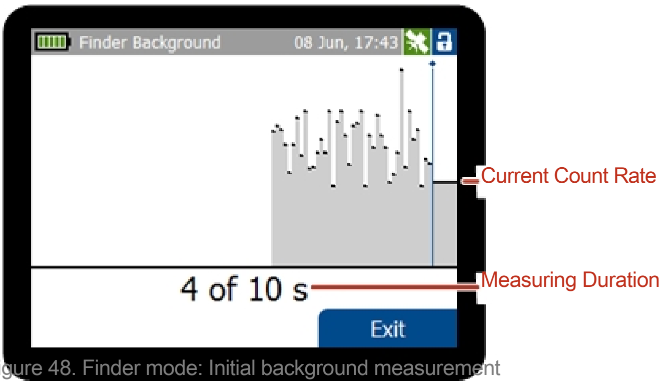


Figure 48. Finder mode: Initial background measurement

If your are in a hurry, you can R Exit the background measurement (not recommended). The instrument will use the most recent background.

4. Move the instrument around to find the radiation source.

   The ICx identiFINDER 2 averages the count rate for adjustable intervals (see 4.39, p. 135) and will guide you with its display (Figure 49, p. 43) but mainly by emitting sounds indicating the distance to the source.

The closer you are to the source, the more "excited" the beeper and the vibrator get.

Listening to the beeper, you can move around to look for the source while watching your step instead of the screen.

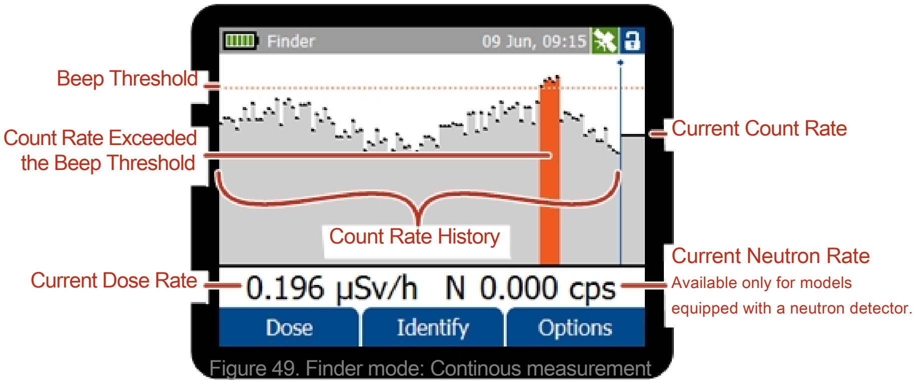

Finder
09 Jun, 09:15
Beep Threshold
Count Rate Exceeded the Beep Threshold
Current Count Rate
Count Rate History
Current Neutron Rate
Available only for models equipped with a neutron detector.
Current Dose Rate
0.196 µSv/h N 0.000 cps
Dose
Identify
Options

Figure 49. Finder mode: Continous measurement

You can change the sensitivity of the beeper (see 4.39, p. 135).

3.4 IDENTIFYING A RADIATION SOURCE

After you detected a radiation source by surveying the ambient dose rate (3.2, p. 39) or by locating its position (3.3, p. 42), you can use the ICx identiFINDER 2's Identification Mode (4.3, p. 60) to find out the nuclide the radiation is originating from.

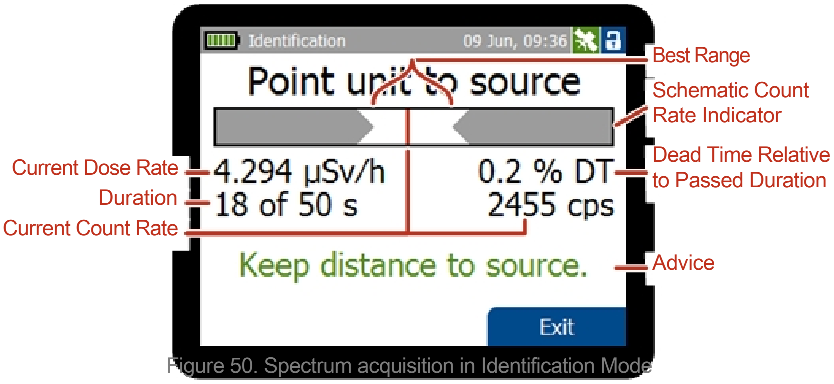
The ICx identiFINDER 2 can identify and report a number of nuclides by analyzing the radiation spectrum they emit. You can inspect the library of these nuclides in appendix B, p. 239 or, with less detail, in the instrument itself by checking the nuclide visibility under

Options Menu (p. 69) ➢ More Options (p. 69) ➢ Identification Options (p. 69) ➢ Nuclide Visibility

Depending on your instrument's settings, you might have to enter a password to access the list (4.6, p. 73).

➔ To identify radionuclides. . .

1. Press M Identify to switch to Identification Mode (Figure 50, p. 44).


Identification 09 Jun, 09:36

Point unit to source

4.294 µSv/h
18 of 50 s

0.2 % DT
2455 cps

Keep distance to source.

Exit
Best Range
Schematic Count Rate Indicator
Dead Time Relative to Passed Duration
Advice
Current Dose Rate
Duration
Current Count Rate

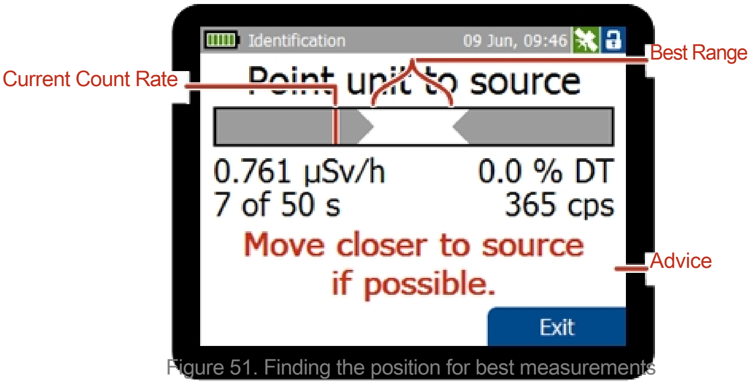
Figure 50. Spectrum acquisition in Identification Mode

The ICx identiFINDER 2 begins to acquire a spectrum of the radiation. Normally, there is a preset acquisition duration, but you can change that to a preset number of counts (4.9, p. 85).

2. Move the instrument into a good position for optimal data acquisition.

   Try to get the current count rate marker into the center of the schematic indicator (Figure 50, p. 44) by getting closer to or away from the source.

   The ICx identiFINDER 2 assists with advice given on-screen (Figure 51, p. 44).


Identification 09 Jun, 09:46

Point unit to source

0.761 µSv/h
7 of 50 s

0.0 % DT
365 cps

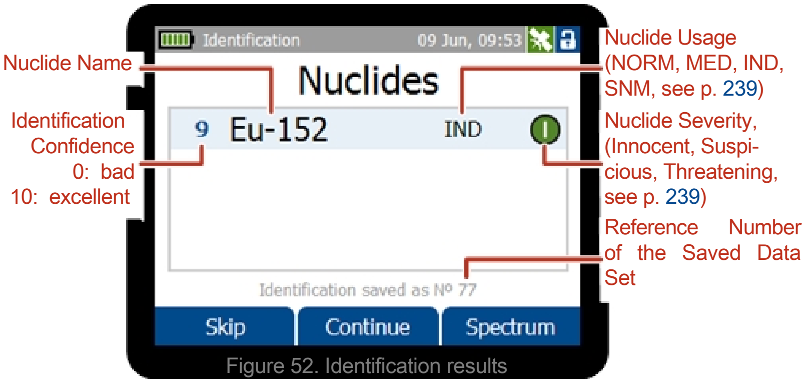
Move closer to source if possible.

Exit
Current Count Rate
Best Range
Advice

Figure 51. Finding the position for best measurements

3. Wait until the preset acquisition duration is over.

   The ICx identiFINDER 2 applies the identification algorithm to the acquired data and shows the result (Figure 52, p. 45). Additionally, the identification results including the spectrum and, if required and available, the GPS coordinates are automatically saved in the ICx identiFINDER 2's database.



Identification 09 Jun, 09:53

Nuclides

9 Eu-152 IND

Identification saved as Nº 77

Skip
Continue
Spectrum
Nuclide Name
Identification Confidence 0: bad 10: excellent
Nuclide Usage (NORM, MED, IND, SNM, see p. 239)
Nuclide Severity, (Innocent, Suspicious, Threatening, see p. 239)
Reference Number of the Saved Data Set

Figure 52. Identification results

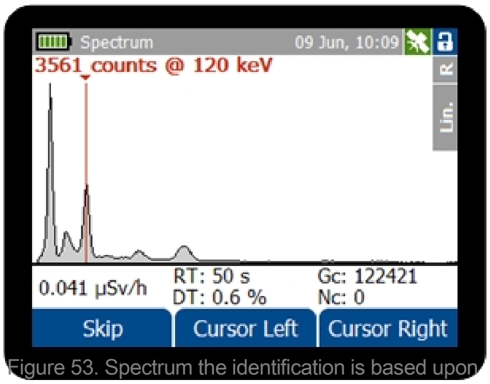
Nuclides the identification algorithm did not recognize or those recognized but having their visibility suppressed (see 4.10, p. 87) are reported as “ Unknown” .

You can specify whether confidence, usage, or severity are shown, see 4.9, p. 85.

4. If necessary, you can acquire more spectrum data to improve the identification by pressing M Continue

   The ICx identiFINDER 2 will acquire more data for the preset extra duration (see 4.9, p. 85).

5. You can inspect the spectrum acquired for the identification by pressing R Spectrum (Figure 53, p. 46). Please refer to 4.7, p. 75 for options and commands for spectrum viewing.



3561 counts @ 120 keV

0.041 µSv/h
RT: 50 s
DT: 0.6 %
Gc: 122421
Nc: 0

Figure 53. Spectrum the identification is based upon

3.5 COMMUNICATE WITH A LOCAL COMPUTER

You can access the ICx identiFINDER 2's settings and stored data from a computer locally connected to the instrument.

The ICx identiFINDER 2 acts as a web server so you need no special software but just your standard web browser. For some computer operating systems, however, you need to install drivers for the connection. Please refer to section 5, p. 145 for details.

➔ To transfer identification results to a local computer . . .

⚠ These instructions assume that your computer is correctly prepared. Consult section 5, p. 145 or your IT administrator for help.

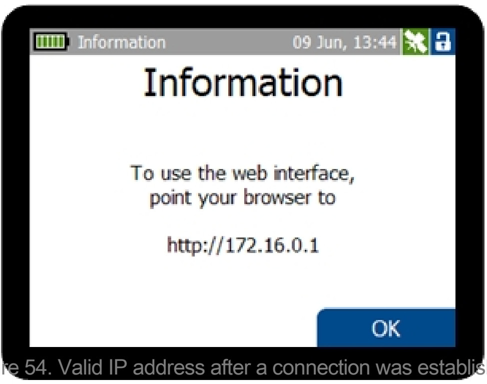
1. Connect the ICx identiFINDER 2 and your computer with the included USB cable (refer to section 5.1, p. 146 for details).

   After establishing the connection, the ICx identiFINDER 2 will display its IP address. (Figure 54, p. 47)

2. Use your computer's standard web browser to navigate to the given IP address.

   The ICx identiFINDER 2's home page opens and displays diverse information regarding your ICx identiFINDER 2 (Figure 55, p. 47).

3. Click Data in the main menu and Identification Results in the secondary menu to open the table with identification results stored in the ICx identiFINDER 2's database (Figure 56, p. 48).

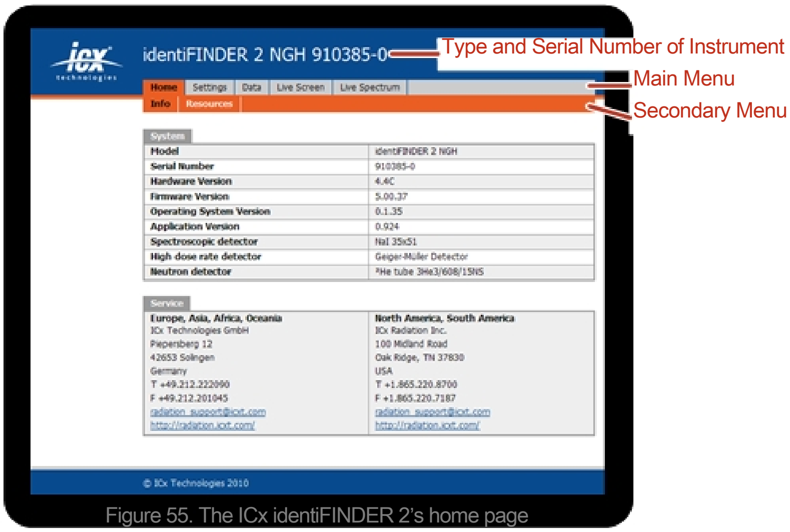


Information

To use the web interface,
point your browser to

http://172.16.0.1

Figure 54. Valid IP address after a connection was established



identiFINDER 2 NGH 910385-0

System

Model	identiFINDER 2 NGH
Serial Number	910385-0
Hardware Version	4.4C
Firmware Version	5.00.37
Operating System Version	0.1.35
Application Version	0.924
Spectroscopic detector	NaI 35x51
High dose rate detector	Geiger-Müller Detector
Neutron detector	^{3}He tube 3He3/608/15NS

Service

Europe, Asia, Africa, Oceania	**North America, South America**
ICx Technologies GmbH Piepersberg 12 42653 Solingen Germany T +49.212.222090 F +49.212.201045 radiation_support@icxt.com http://radiation.icxt.com/	ICx Radiation Inc. 100 Midland Road Oak Ridge, TN 37830 USA T +1.865.220.8700 F +1.865.220.7187 radiation_support@icxt.com http://radiation.icxt.com/

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Figure 55. The ICx identiFINDER 2's home page

4. To look for the desired data set you can click the sorting button in one of the column titles (Figure 56, p. 48).
5. If many data sets are stored in the database, you might need to turn pages with the multipage table navigation (Figure 56, p. 48).
6. To view a summary of a data set, hover the pointer over the saving date of a data set (Figure 56, p. 48).
7. To view a detailed report of a data set, click the saving date.

   The details will open in a new window or a new tab, depending on your browser's settings (Figure 57, p. 49).

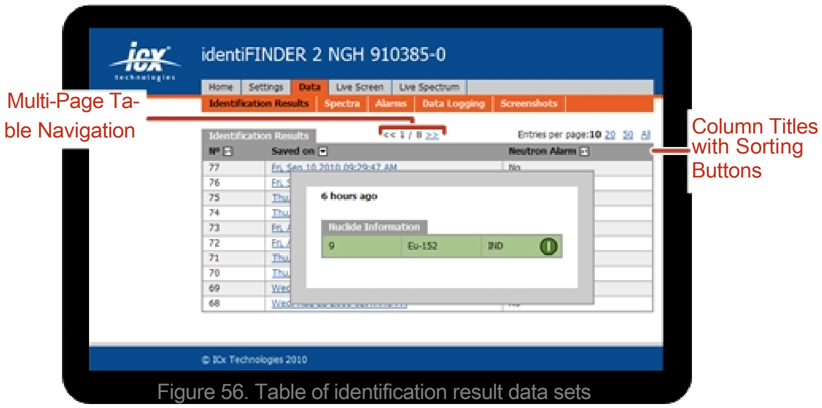

Multi-Page Table Navigation
Column Titles with Sorting Buttons
identiFINDER 2 NGH 910385-0
Home
Settings
Data
Live Screen
Live Spectrum
Identification Results
Spectra
Alarms
Data Logging
Screenshots
Identification Results
<< 1 / 8 >>
Entries per page:10 20 50 All
Nº
Saved on
Neutron Alarm
6 hours ago
Nuclide Information
9
Eu-152
IND
© ICx Technologies 2010

Figure 56. Table of identification result data sets

8. To print the report, use your browser's Print command.
9. To download the identification result to your computer as an ANSI N42.42 file, click Download and follow the instructions of your web browser.

3.6 SENDING RESULTS TO A REMOTE SERVER

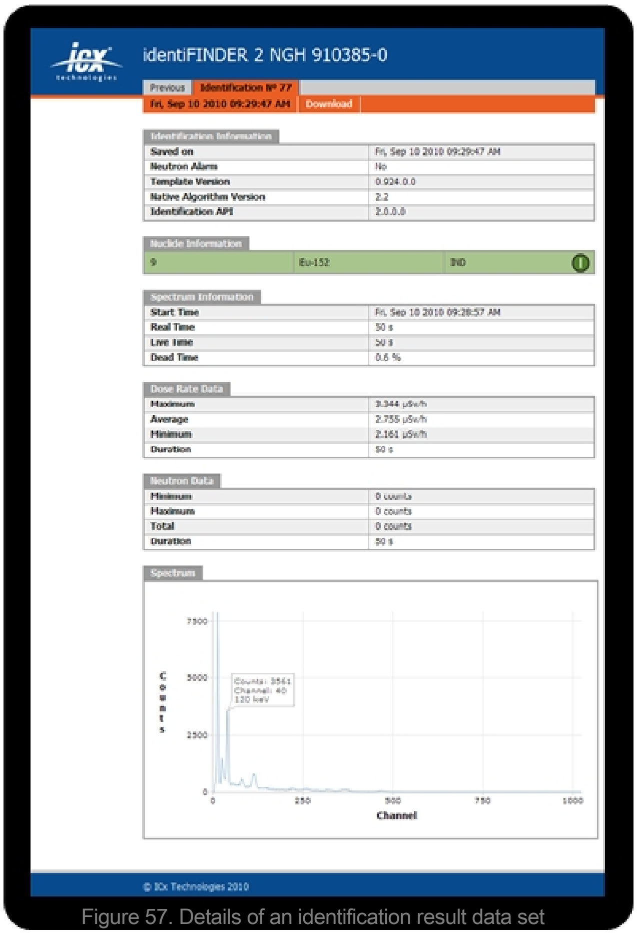
You can transfer identification results or spectra to a remote server for further processing or analysis. An ANSI N42.42 file containing the data is sent from the ICx identiFINDER 2 to a cell phone via short range Bluetooth radio and from the phone to the remote server via the Internet.

The connection requires some initial setup on the ICx identiFINDER 2 and on the mobile phone, please refer to section 7, p. 197 for details.

➔ To send identification results to a remote server . . .

⚠ These instructions assume that your ICx identiFINDER 2 and your cell phone are correctly prepared. Consult section 7, p. 197 or your IT administrator for help.

1. While the identification results (for example of section 3.4, p. 43, Figure 52, p. 45) are displayed, press L Skip to reveal the commands Send and Exit (Figure 58, p. 50).
2. Initiate the data transfer with M Send
   A summary of the data set is shown (Figure 59, p. 50).


icx technologies
Previous
Download

identiFINDER 2 NGH 910385-0

Identification № 77

Fri, Sep 10 2010 09:29:47 AM

Identification Information

Saved on	Fri, Sep 10 2010 09:29:47 AM
Neutron Alarm	No
Template Version	0.924.0.0
Native Algorithm Version	2.2
Identification API	2.0.0.0

Nuclide Information

9	Eu-152	IND

Spectrum Information

Start Time	Fri, Sep 10 2010 09:28:57 AM
Real Time	50 s
Live Time	50 s
Dead Time	0.6 %

Dose Rate Data

Maximum	3.344 µSv/h
Average	2.755 µSv/h
Minimum	2.161 µSv/h
Duration	50 s

Neutron Data

Minimum	0 counts
Maximum	0 counts
Total	0 counts
Duration	50 s

Spectrum

Counts
7500
5000
2500
0
0
250
500
750
1000
Channel
Counts: 3561
Channel: 40
120 keV

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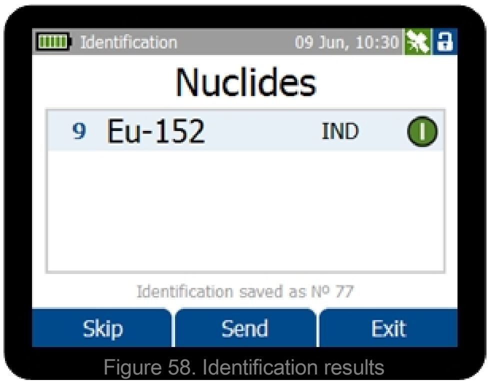
Figure 57. Details of an identification result data set

3. Start the data transfer with M Send

   During the transfer of data you will be kept posted about the progress of the transmission steps (Figure 60, p. 50).

If this is the first time you are sending data since switching on the ICx identiFINDER 2, you have to pair it with your Bluetooth phone. Please refer to section 4.33, p. 122 for the complete details.

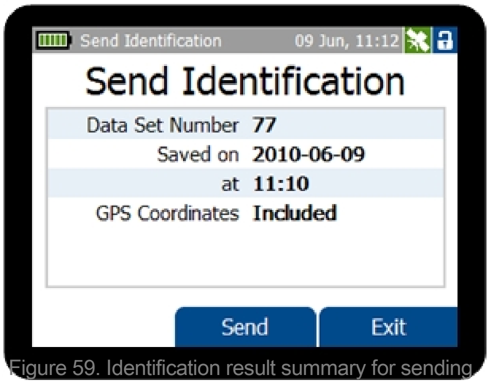

Identification
09 Jun, 10:30
Skip
Send
Exit

Nuclides

9 Eu-152 IND

Identification saved as Nº 77

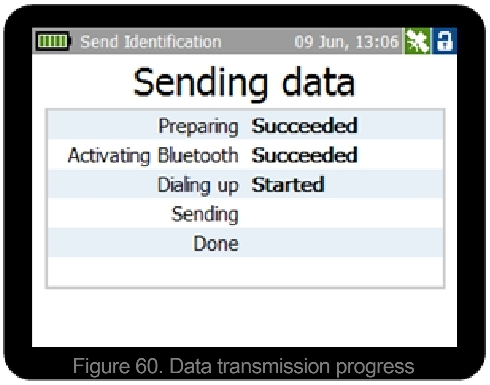
Figure 58. Identification results


Send Identification
09 Jun, 11:12
Send
Exit

Send Identification

Data Set Number	77
Saved on	2010-06-09
at	11:10
GPS Coordinates	Included

Figure 59. Identification result summary for sending


Send Identification
09 Jun, 13:06

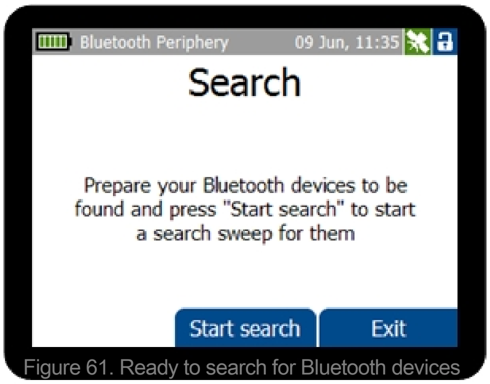
Sending data

Preparing	Succeeded
Activating Bluetooth	Succeeded
Dialing up	Started
Sending	
Done	

Figure 60. Data transmission progress

➔ To pair with a Bluetooth device. . .

1. Press M Start search (Figure 61, p. 51) to have the ICx identiFINDER 2 search for suitable Bluetooth devices.



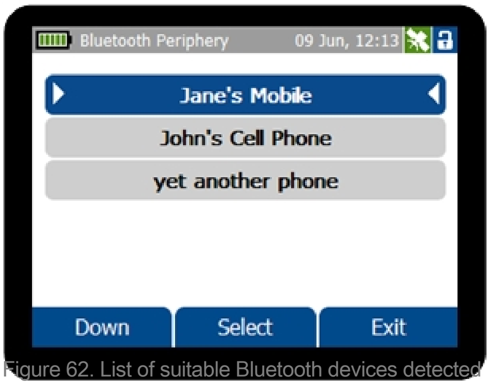
Bluetooth Periphery 09 Jun, 11:35

Search

Prepare your Bluetooth devices to be found and press "Start search" to start a search sweep for them

Figure 61. Ready to search for Bluetooth devices

2. Choose the desired Bluetooth device from the list shown (Figure 62, p. 51) with L Down



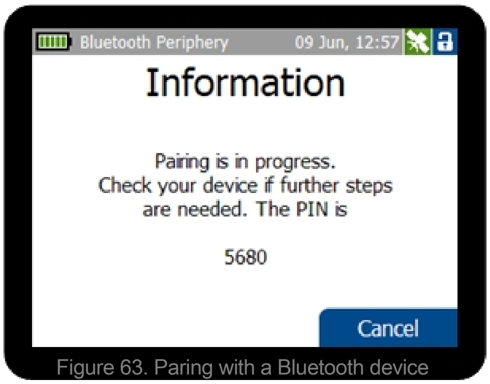
Bluetooth Periphery 09 Jun, 12:13

Figure 62. List of suitable Bluetooth devices detected

3. To start the pairing with the chosen device, press M Select Your device might require additional steps like entering a PIN. Use the PIN shown on your ICx identiFINDER 2 screen (Figure 63, p. 52).
4. Your ICx identiFINDER 2 displays some details about the paired device and is ready to send data.

3.7 SWITCHING OFF

After you are done with all your measurements, you should shut down the ICx identiFINDER 2. The details on shutting down are given in section 2.4, p. 33, the recommended procedure follows:


Bluetooth Periphery
09 Jun, 12:57
Cancel

Information

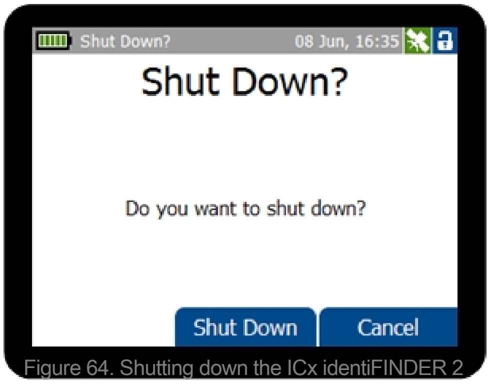
Pairing is in progress.
Check your device if further steps
are needed. The PIN is

5680

Figure 63. Paring with a Bluetooth device

➔ To shut down the ICx identiFINDER 2. . .

1. Press and hold ⏻
   After a couple of seconds, the shut down screen will be displayed (Figure 64, p. 52).


Shut Down?
08 Jun, 16:35
Shut Down
Cancel

Shut Down?

Do you want to shut down?

Figure 64. Shutting down the ICx identiFINDER 2

2. Press M to confirm the shut down command.

Store your ICx identiFINDER 2 in its holster and in its case while not in use.

4 ICx identiFINDER 2 Reference

This chapter provides detailed descriptions of the ICx identiFINDER 2's three essential measuring modes for day-to-day procedures, the alarms raised when radiation is above certain thresholds, the vast number of settings that influence its behavior, and the commands for expert analyses and advanced operations.

Dose Rate Mode

Observe the ambient radiation (see 4.1, p. 54)

Finder Mode

Locate radiation sources (see 4.2, p. 57)

Identification Mode

Identify radiating nuclides (see 4.3, p. 60)

Alarms

Alarms overriding all other modes and commands (see 4.4, p. 64)

ICx identiFINDER 2 Menus

Access settings and commands for special analyses and operations (see 4.5, p. 69)

4.1 DOSE RATE MODE

The Dose Rate Mode is the basic operation mode of the ICx identiFINDER 2. It is activated after starting up the instrument.

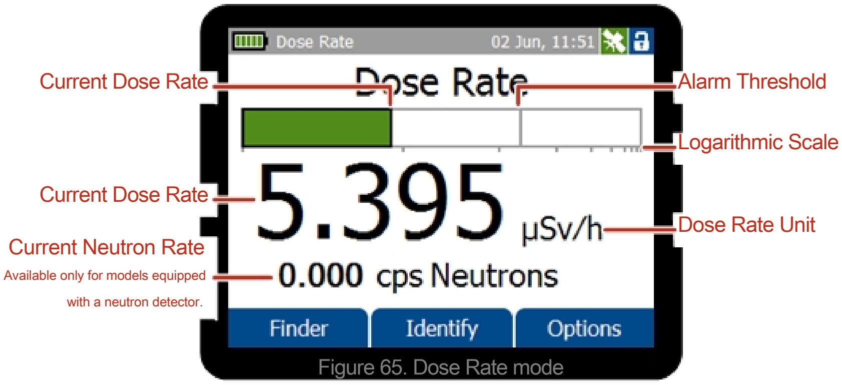

Dose Rate
02 Jun, 11:51
Current Dose Rate
Dose Rate
Alarm Threshold
Logarithmic Scale
Current Dose Rate
5.395 µSv/h
Dose Rate Unit
Current Neutron Rate
Available only for models equipped with a neutron detector.
0.000 cps Neutrons
Finder
Identify
Options

Figure 65. Dose Rate mode

The dose rate display (Figure 65, p. 54) shows two representations of the gamma dose rate:

Analog

A colored horizontal bar along a logarithmic axis ranging from 0.001 µSv/h to 10 Sv/h (1 Sv = 100 rem) across the upper part of the screen.

A vertical line marks the position of dose rate alarm threshold (see 4.42, p. 139 for setting the threshold).

If the dose rate raises above the threshold, the color of the bar representing the current dose rate changes.

Digital

Large digits and a dose rate unit in the screen's center.

The unit is adjusted to the order of magnitude of the dose rate (µSv/h, mSv/h, Sv/h) and reflects your preferences (see 4.40, p. 137).

If your model is equipped with a neutron detector, the current neutron rate is shown below the gamma dose rate.

The gamma dose rate is normally computed from the spectrum registered by the scintillation crystal. Intense radiation hitting the crystal renders the registered data uninterpretable. If the dose rate rises above 500 µSv/h, the ICx identiFINDER 2 switches from the scintillation crystal to the Geiger-Müller tube and indicates this on the screen (Figure 66, p. 55).

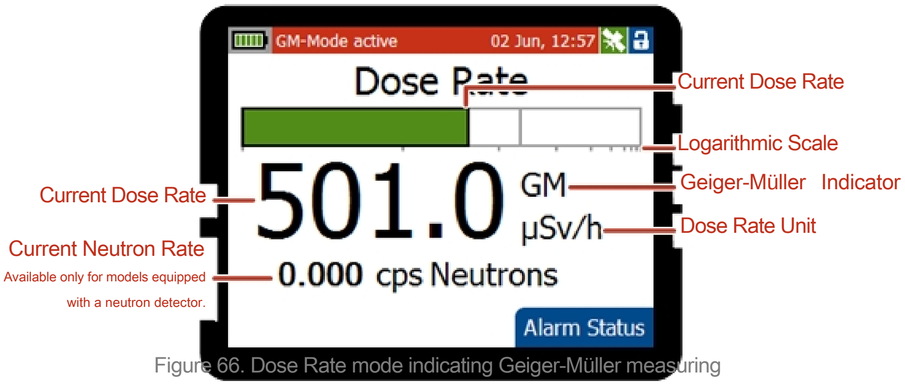

GM-Mode active
02 Jun, 12:57
Dose Rate
501.0
GM
µSv/h
0.000 cps Neutrons
Alarm Status
Current Dose Rate
Logarithmic Scale
Geiger-Müller Indicator
Dose Rate Unit
Current Dose Rate
Current Neutron Rate
Available only for models equipped with a neutron detector.

Figure 66. Dose Rate mode indicating Geiger-Müller measuring

■ Overload is indicated if the dose rate raises above 10 mSv/h (Figure 67, p. 55). In this condition, the instrument's results are unreliable.

It is strongly recommended that you retreat from environments with radiation that high.

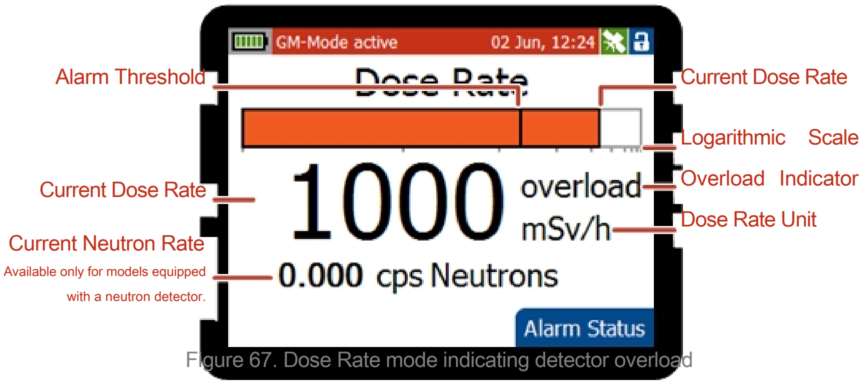

GM-Mode active
02 Jun, 12:24
Dose Rate
1000
overload
mSv/h
0.000 cps Neutrons
Alarm Status
Alarm Threshold
Current Dose Rate
Logarithmic Scale
Overload Indicator
Dose Rate Unit
Current Dose Rate
Current Neutron Rate
Available only for models equipped with a neutron detector.

Figure 67. Dose Rate mode indicating detector overload

SETTINGS AND COMMANDS

⚠ Most operations of the ICx identiFINDER 2, for example identifying nuclides, need reliable data from the scintillation crystal. While measuring the dose rate with the Geiger-Müller tube, all the other functions are not available.

Finder

Switch to Finder mode with (see 4.2, p. 57).

Identify

Switch to Identification mode with (see 4.3, p. 60).

Options

Inspect and change options with R (see 4.5, p. 69).

Alarm Status

View the current alarm status while the Geiger-Müller tube is active with R (see 4.4, p. 64).

4.2 FINDER MODE

You can use the ICx identiFINDER 2 in Finder Mode to locate a radiation source. Move the instrument around the vicinity of a suspected source and monitor the display, the red LED, vibrator, and beeper of the ICx identiFINDER 2 for changes. The vibration, and especially the sound, get more “excited” the closer the instrument is to the source.

You can switch off the LED, the vibrator, and the beeper (see 4.41, p. 138).

Immediately after switching to the Finder mode, the ICx identiFINDER 2 begins a background measurement for 10 seconds (Figure 68, p. 57).

For better results, move the ICx identiFINDER 2 away from suspected radiation sources during the background measurement.

The duration of the background measurement is shown below the chart showing the measurements. If you don’t want to wait until the background is measured (not recommended), you can cancel the background measurement. The ICx identiFINDER 2 will then use the most recent previous background measurement.

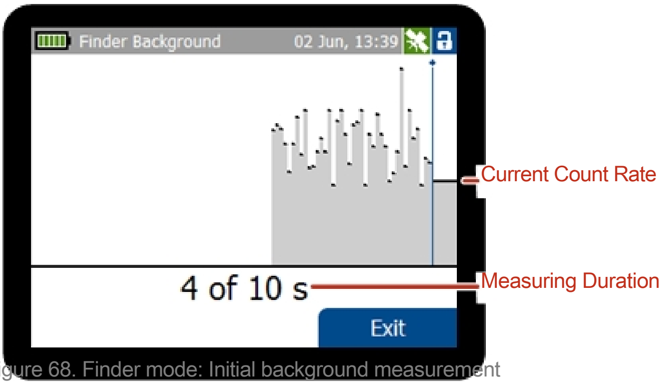


Figure 68. Finder mode: Initial background measurement

After the background measurement has finished, the Finder mode screen appears (Figure 69, p. 58). If your model is equipped with a neutron detector, the current neutron rate is displayed at the bottom of the screen.

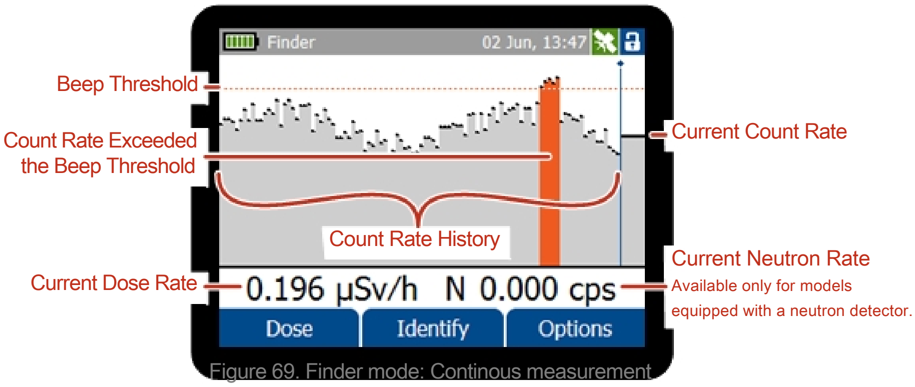

Finder
02 Jun, 13:47
Beep Threshold
Count Rate Exceeded the Beep Threshold
Current Count Rate
Count Rate History
Current Neutron Rate
Available only for models equipped with a neutron detector.
Current Dose Rate
0.196 µSv/h N 0.000 cps
Dose
Identify
Options

Figure 69. Finder mode: Continous measurement

The current count rate is averaged for a period you can specify (see 4.39, p. 135). The average of the most recent period is visualized as a wide column along the right edge of the screen.

Narrow columns representing older periods fill the screen's center from right to left, pushing the oldest periods off the screen's left edge.

The vertical scaling of the chart is adjusted continuously to make best use of the available screen height. A dashed line above the chart indicates the adjustable (see 4.39, p. 135) threshold for audible feed back. If the count rate rises above this level, you get notified by the red LED, the vibrator, and the beeper. The sound frequency is proportional to the count rate, that is, the closer the instrument gets to the source the higher the tone.

You can mute the sound by pressing for a moment. Muting remains in effect until you leave and re-enter the Finder mode and the background measurement is repeated.

SETTINGS AND COMMANDS

Dose

Switch to Dose Rate mode with (see 4.2, p. 57).

Identify

Switch to Identification mode with (see 4.3, p. 60).

Options

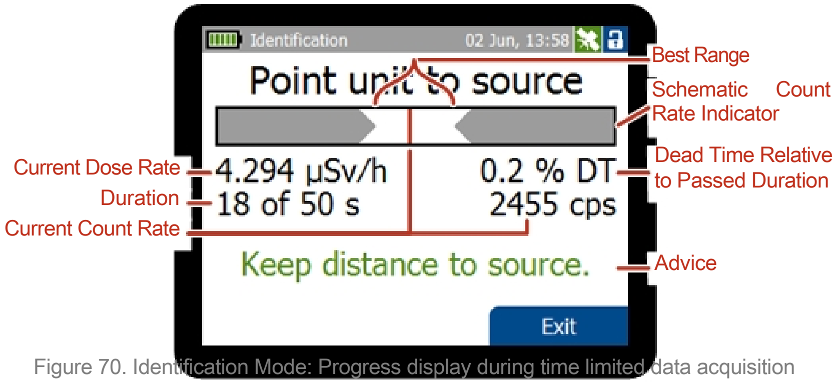
Inspect and change options with (see 4.5, p. 69).

4.3 IDENTIFICATION MODE

You can switch the ICx identiFINDER 2 to Identification Mode to perform the actions necessary to identify the nuclides gamma radiation is originating from.

The instrument acquires a gamma spectrum for a duration you can specify (4.9, p. 85) and shows the progress and some parameters of the measurement (Figure 70, p. 60).

The spectrum acquired here overwrites the current contents of the spectrum viewer (4.7, p. 75). Data acquisition in the spectrum viewer, if any, is stopped.


Best Range
Schematic Count Rate Indicator
Current Dose Rate
Dead Time Relative to Passed Duration
Duration
Current Count Rate
Advice
Exit

Identification 02 Jun, 13:58

Point unit to source

4.294 µSv/h 0.2 % DT

18 of 50 s 2455 cps

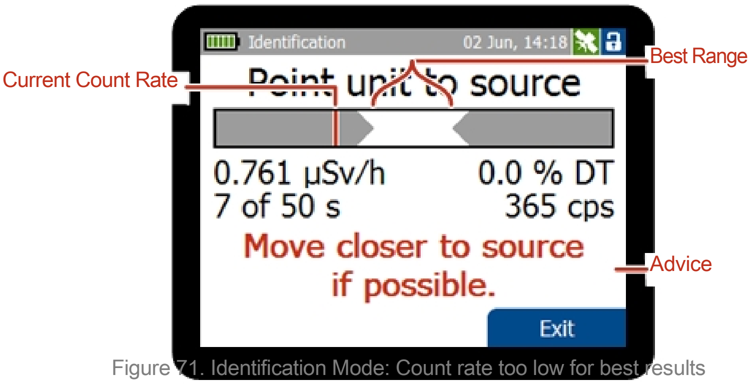
Keep distance to source.

Figure 70. Identification Mode: Progress display during time limited data acquisition

The ICx identiFINDER 2 achieves better identification results if the count rate is within a certain range shown in the center of in the indicator. While the current count rate is outside the desired range, advices are shown so you can shorten (Figure 71, p. 61) or lengthen (Figure 72, p. 61) the distance between the instrument and the radiation source.

If the acquisition is limited not by the time, but the number of counts (4.9, p. 85), the display looks slightly different (Figure 73, p. 61).

You should try to move the instrument into a good position although the advice on moving the instrument in a position for best identification is not shown in this mode to make room for the number of counts relative to the required minimum.



Identification 02 Jun, 14:18

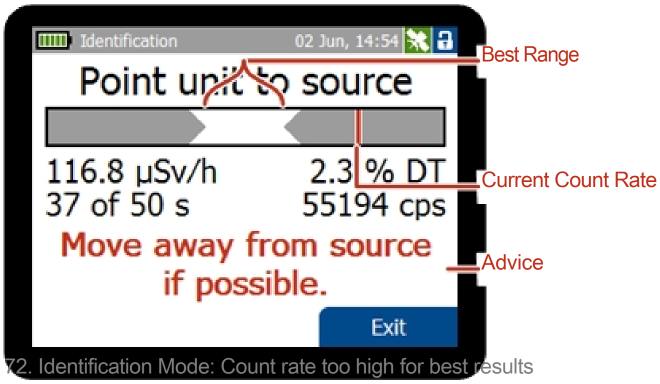
Point unit to source

0.761 µSv/h 0.0 % DT
7 of 50 s 365 cps

Move closer to source if possible.

Exit
Current Count Rate
Best Range
Advice

Figure 71. Identification Mode: Count rate too low for best results



Identification 02 Jun, 14:54

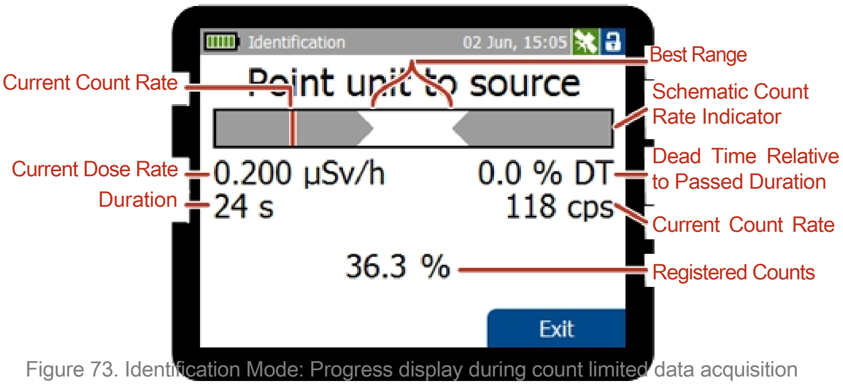
Point unit to source

116.8 µSv/h 2.3 % DT
37 of 50 s 55194 cps

Move away from source if possible.

Exit
Best Range
Current Count Rate
Advice

Figure 72. Identification Mode: Count rate too high for best results



Identification 02 Jun, 15:05

Point unit to source

0.200 µSv/h 0.0 % DT
24 s 118 cps

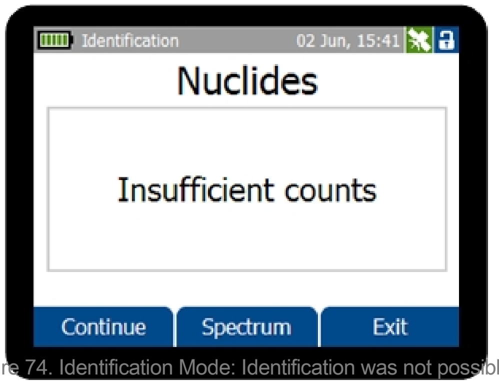
36.3 %

Exit
Current Count Rate
Current Dose Rate
Duration
Best Range
Schematic Count Rate Indicator
Dead Time Relative to Passed Duration
Current Count Rate
Registered Counts

Figure 73. Identification Mode: Progress display during count limited data acquisition

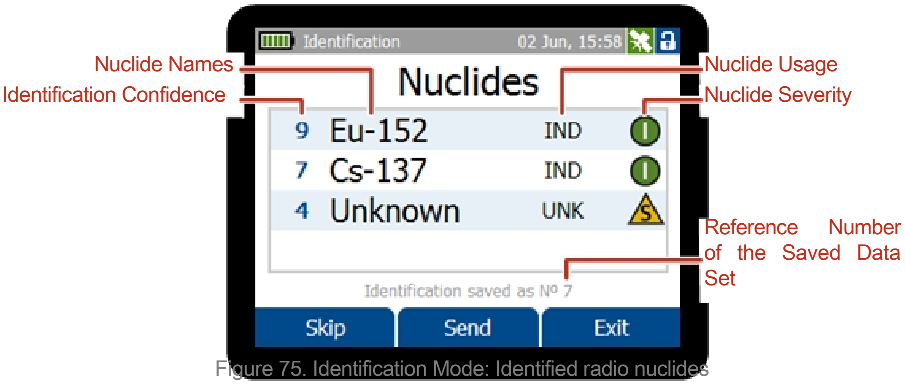
The acquisition of data stops after the duration or count criterion (4.9, p. 85) is met or when you Exit with . The ICx identiFINDER 2 applies the identification algorithm and displays the result (Figure 74, p. 62 and Figure 75, p. 62). If nuclides were identified, the results are saved. The number of the saved data set is shown so you can refer to it for further processing.

You can specify whether confidence, usage, or severity are shown, see 4.9, p. 85.


Identification
02 Jun, 15:41
Nuclides
Continue
Spectrum
Exit

Insufficient counts

Figure 74. Identification Mode: Identification was not possible.


Nuclide Names
Identification Confidence
Nuclide Usage
Nuclide Severity
Reference Number of the Saved Data Set
Identification
02 Jun, 15:58
Nuclides
Skip
Send
Exit

9 Eu-152 IND
7 Cs-137 IND
4 Unknown UNK

Identification saved as № 7

Figure 75. Identification Mode: Identified radio nuclides

Nuclides the identification algorithm did not recognize or those recognized but having their visibility suppressed (see 4.10, p. 87) are reported as “ Unknown” .

SETTINGS AND COMMANDS

Skip

Cycle the list of commands with (see 2.2.2, p. 22).

Send

Go to **Send Identification** (see 4.31, p. 118) with M avoiding the detour around the normal options menu hierarchy. The current identification will be already chosen for sending.

Exit

Return to the superior menu with R

Continue

Acquire more data to improve the identification. The acquisition continues for the duration you specified (see 4.9, p. 85) no matter whether you limited the duration or the minimum number of counts for the initial acquisition.

Spectrum

Inspect the acquired spectrum.

⚠ This command is available only after you entered the password or if the password protection is off.

Please refer to 4.7, p. 75 for options and commands for spectrum viewing. After you return from the spectrum, you can **Continue** to acquire data with M , or **Exit** the identification mode with R

4.4 ICx identiFINDER 2 ALARMS

If the ICx identiFINDER 2 detects radiation above certain thresholds you can specify (see 4.42, p. 139 ff.), it raises an alarm. Alarms can be reported via several annunciators:

Main Display

Details of the alarm are always displayed on-screen, no matter which other activity was displayed at the time the alarm condition was met (for example, Figure 77, p. 66).

The screen back light will be switched on if it timed out (4.15, p. 94).

The alarm details remain on the screen until you dismiss them.

Status Bar

If you dismiss the alarm details, the alarm and warning information is shown in the status bar along the display's top edge alternating with the normal information shown there (Figure 76, p. 65).

LED LEDs close to the operating keys (Figure 9, p. 16) flash in several patterns.

Beeper

The beeper emits various sound patterns.

Vibrator

The vibrator shakes the instrument (and adds a little sound).

You can switch the LEDs, the beeper and the vibrator on or off (see 4.41, p. 138).

All alarms are stored in the ICx identiFINDER 2's database, including date and time (always) and GPS coordinates (on request, if available, see 4.18, p. 100).

You can review saved alarms via the web interface (6.13, p. 185) or delete them (4.24, p. 108)

SETTINGS AND COMMANDS

Mute

Switch off the beeper and vibrator for the current alarm with .
The next alarm, if any, reactivates sound and vibration.

Acknowledge

Acknowledge the alarm with

The screen returns to the content displayed before the alarm was raised (Figure 76, p. 65). The alarm details, however, will alternate with the standard information in the title bar until the radiation drops below the alarm threshold.

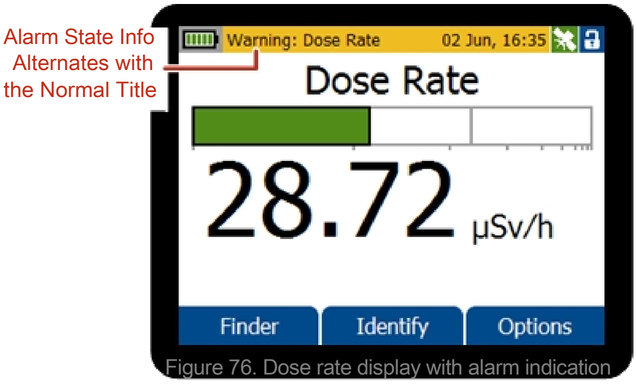
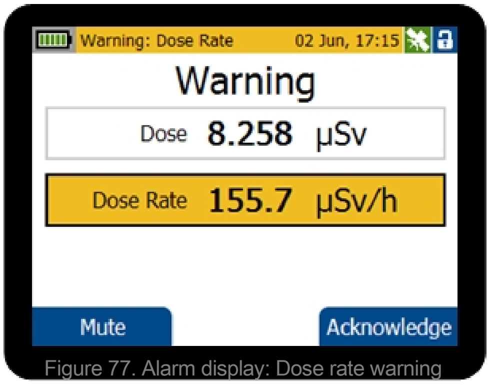

Alarm State Info Alternates with the Normal Title
Warning: Dose Rate
02 Jun, 16:35
Dose Rate
28.72 µSv/h
Finder
Identify
Options

Figure 76. Dose rate display with alarm indication

4.4.1 GAMMA ALARMS

The ICx identiFINDER 2 continuously compares the detected gamma radiation against thresholds you can specify for

- dose warning and dose alarm (see 4.42, p. 139)
- dose rate warning and dose rate alarm (see 4.43, p. 141).


Warning: Dose Rate 02 Jun, 17:15

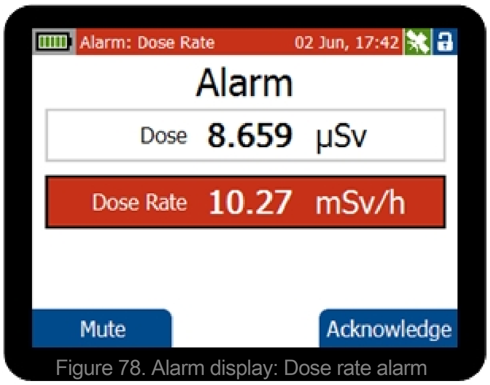
Warning

Dose 8.258 µSv

Dose Rate 155.7 µSv/h

Figure 77. Alarm display: Dose rate warning

When a threshold is exceeded, an appropriate warning or alarm is raised and reported visually (Figure 77, p. 66 and Figure 78, p. 66). The appropriate behaviour of the annunciators is detailed in Figure 79, p. 67.


Alarm: Dose Rate 02 Jun, 17:42

Alarm

Dose 8.659 µSv

Dose Rate 10.27 mSv/h

Figure 78. Alarm display: Dose rate alarm

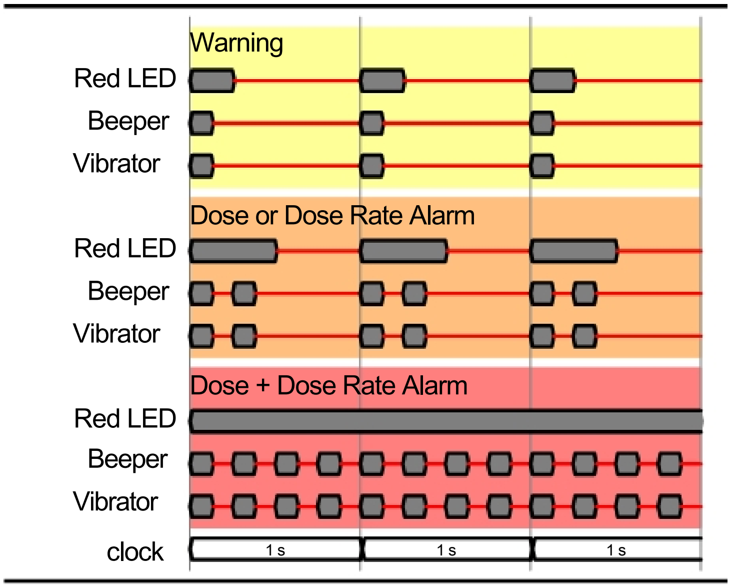

Warning
Red LED
Beeper
Vibrator
Dose or Dose Rate Alarm
Red LED
Beeper
Vibrator
Dose + Dose Rate Alarm
Red LED
Beeper
Vibrator
clock
1 s
1 s
1 s

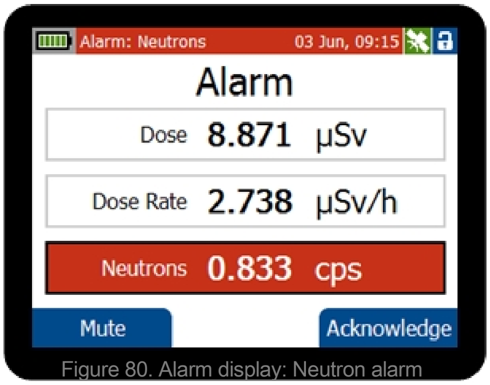
Figure 79. Gamma alarms as announced by the red LED, beeper, and vibrator

4.4.2 NEUTRON ALARMS

Available only for models equipped with a neutron detector.

The ICx identiFINDER 2 continuously compares the number of detected neutrons per given period against thresholds you can specify for warnings and alarms (see 4.44, p. 142).

When a threshold is exceeded, an appropriate warning or alarm is raised and reported visually (Figure 80, p. 68). The appropriate behaviour of the annunciators is detailed in Figure 81, p. 68.



Alarm: Neutrons 03 Jun, 09:15

Alarm

Dose 8.871 µSv

Dose Rate 2.738 µSv/h

Neutrons 0.833 cps

Mute
Acknowledge

Figure 80. Alarm display: Neutron alarm

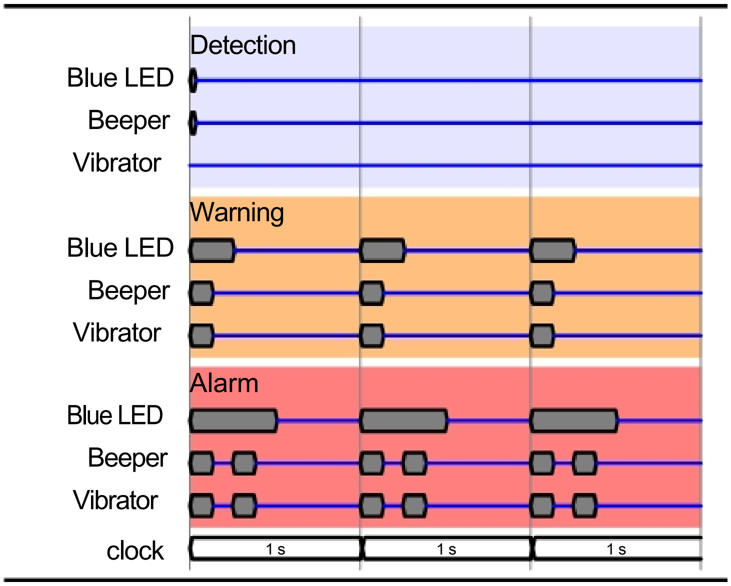

Detection
Blue LED
Beeper
Vibrator
Warning
Blue LED
Beeper
Vibrator
Alarm
Blue LED
Beeper
Vibrator
clock
1 s
1 s
1 s

Figure 81. Neutron incidents as announced by the blue LED, beeper, and vibrator

4.5 ICx identiFINDER 2 MENUS

You can access the commands for expert analyses, advanced operations, and the vast number of settings that influence the behavior and appearance of your ICx identiFINDER 2 by navigating the menu hierarchy.

Depending on your model, there are different entry points for the menu hierarchy.

4.5.1 QUICK OPTION MENU (OUTLINE)

Some ICx identiFINDER 2 models provide easy access to a few commands and settings without password. The complete menu listed below is available as well.

- Main Menu
  - Advanced Menu .... see 4.5.2, p. 69
  - Recalibrate .... see 4.14, p. 92
  - Clock Settings .... see 4.16, p. 97
  - Current Alarm State .... see 4.45, p. 144
  - Connectivity Options

4.5.2 COMPLETE OPTION MENUS (OUTLINE)

All ICx identiFINDER 2 models provide access to the complete set of commands and settings. Usually, you have to enter a password (see 4.6, p. 73) before access.

- Options Menu
  - More Options
    - Show Spectrum .... see 4.7, p. 75
      - Calibration Check .... see 4.8, p. 83
    - Identification Options
      - Identification Settings .... see 4.9, p. 85
      - Nuclide Visibility .... see 4.10, p. 87
      - Nuclide Usage .... see 4.11, p. 88

  - Nuclide Severity ... see 4.12, p. 89
- Presets ... see 4.13, p. 91
- Recalibrate ... see 4.14, p. 92
- Advanced Options
  - General Options
    - Display Settings ... see 4.15, p. 94
    - Clock Settings ... see 4.16, p. 97
    - Feedback Settings ... see 4.17, p. 99
    - GPS Settings ... see 4.18, p. 100
  - Maintenance
    - Change Password
      - Set Password ... see 4.19, p. 101
      - Clear Password ... see 4.20, p. 102
    - Show Status ... see 4.21, p. 103
    - Reset Factory Settings ... see 4.22, p. 107
    - Erase Data
      - Erase All Spectra ... see 4.23, p. 108
      - Erase All Alarms ... see 4.24, p. 108
      - Erase All Data Logging Entries ... see 4.25, p. 109
      - Erase All Screenshots ... see 4.26, p. 109
    - Factory Tests ... see 4.27, p. 109
  - Calibration Source ... see 4.28, p. 111
  - Data Logging
    - Data Logger ... see 4.29, p. 113
    - View Logged Data ... see 4.30, p. 115
  - Connectivity Options
    - Send Data
      - Send Identification ... see 4.31, p. 118
      - Send Spectrum ... see 4.32, p. 121
    - Bluetooth Periphery ... see 4.33, p. 122

· · · · Remote Server Settings . see 4.34, p. 126
· · · · Mass Storage .. see 4.35, p. 128
· · · · Network ... see 4.36, p. 129
· · · · Report Settings ... see 4.37, p. 131
· Gamma, Neutron Counters .. see 4.38, p. 133
· Finder Settings .. see 4.39, p. 135
· Dose Rate Settings . see 4.40, p. 137
· Alarm Options
· · Alarm Indicators . see 4.41, p. 138
· · Dose Alarm Thresholds ... see 4.42, p. 139
· · Dose Rate Alarm Thresholds . see 4.43, p. 141
· · Neutron Alarm Thresholds ... see 4.44, p. 142
· · Current Alarm State ... see 4.45, p. 144

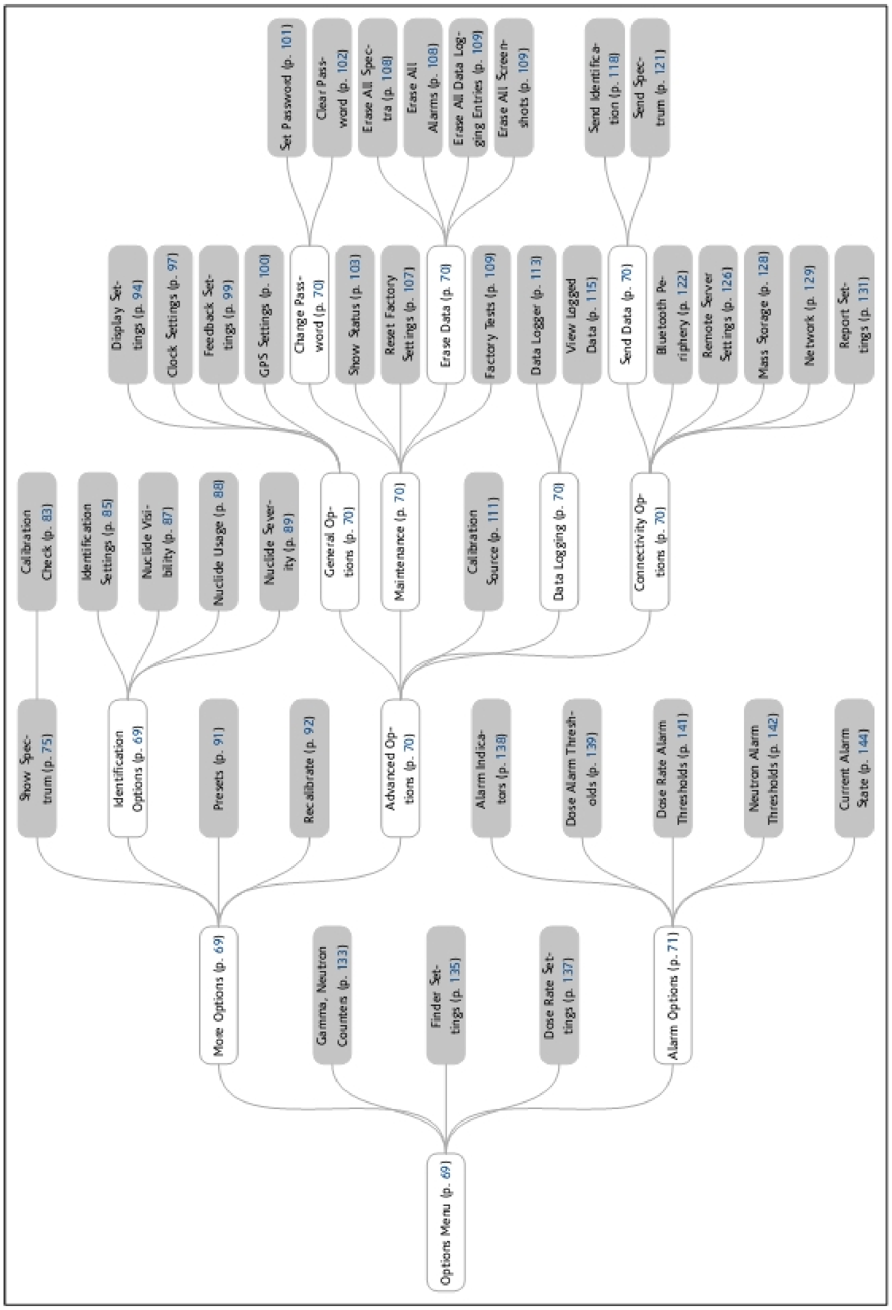

Options Menu (p. 69)
More Options (p. 69)
Gamma, Neutron Counters (p. 133)
Finder Settings (p. 135)
Dose Rate Settings (p. 137)
Alarm Options (p. 71)
Show Spectrum (p. 75)
Identification Options (p. 69)
Presets (p. 91)
Recalibrate (p. 92)
Advanced Options (p. 70)
Alarm Indicators (p. 138)
Dose Alarm Thresholds (p. 139)
Dose Rate Alarm Thresholds (p. 141)
Neutron Alarm Thresholds (p. 142)
Current Alarm State (p. 144)
Calibration Check (p. 83)
Identification Settings (p. 85)
Nuclide Visibility (p. 87)
Nuclide Usage (p. 88)
Nuclide Severity (p. 89)
General Options (p. 70)
Maintenance (p. 70)
Calibration Source (p. 111)
Data Logging (p. 70)
Connectivity Options (p. 70)
Display Settings (p. 94)
Clock Settings (p. 97)
Feedback Settings (p. 99)
GPS Settings (p. 100)
Change Password (p. 70)
Show Status (p. 103)
Reset Factory Settings (p. 107)
Erase Data (p. 70)
Factory Tests (p. 109)
Data Logger (p. 113)
View Logged Data (p. 115)
Send Data (p. 70)
Bluetooth Peripheral (p. 122)
Remote Server Settings (p. 126)
Mass Storage (p. 128)
Network (p. 129)
Report Settings (p. 131)
Set Password (p. 101)
Clear Password (p. 102)
Erase All Spectra (p. 108)
Erase All Alarms (p. 108)
Erase All Data Logging Entries (p. 109)
Erase All Screenshots (p. 109)
Send Identification (p. 118)
Send Spectrum (p. 121)

Figure 82. Hierarchy of the ICx identiFINDER 2 menu

4.6 PASSWORD ENTRY

If your ICx identiFINDER 2 is protected by a password, you will have to enter it before you can access most of the options and settings menus of the instrument (Figure 83, p. 73). A closed padlock on the screen indicates that you have to enter a password.

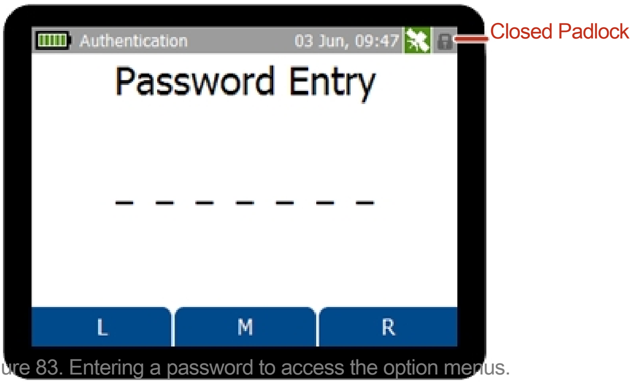


Figure 83. Entering a password to access the option menus.

If your model comes with a factory-set password, it is LMRLMRL.

For better protection against accidental changes of the instrument characteristics, you should change the password to something else (4.19, p. 101).

If you don’t need protection but want faster access to the menus, you can remove the password (4.20, p. 102).

SETTINGS AND COMMANDS

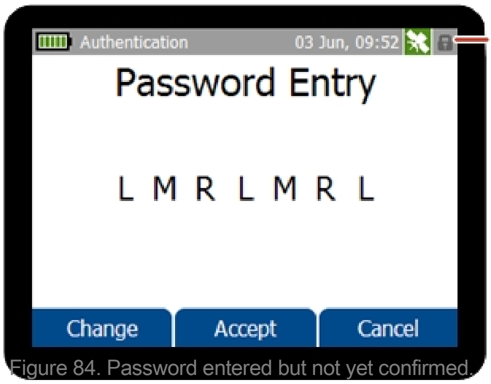
Enter the password by seven presses in the correct sequence.

To cancel the password entry press for a moment.

After the seventh press, the key labels change (Figure 84, p. 74).

Change

Start over entering the password.


Authentication
03 Jun, 09:52
Change
Accept
Cancel
Closed Padlock

Password Entry

L M R L M R L

Figure 84. Password entered but not yet confirmed.

Accept

Confirm your password entry and have the instrument check your entry for correctness.

After you entered the correct password, you don’t have to enter it again until you switch off the instrument. This is indicated by an open padlock (Figure 85, p. 74)

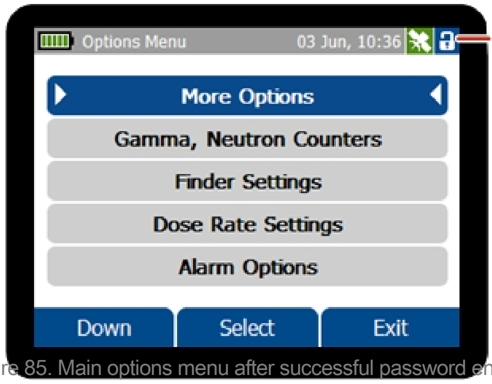
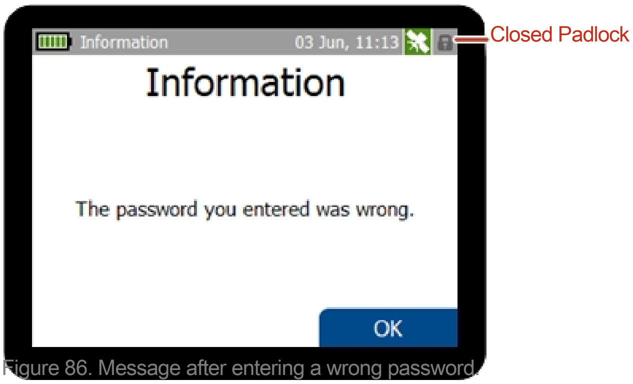

Options Menu
03 Jun, 10:36
Open Padlock
More Options
Gamma, Neutron Counters
Finder Settings
Dose Rate Settings
Alarm Options
Down
Select
Exit

Figure 85. Main options menu after successful password entry.

If you enter a wrong password, you will be informed (Figure 86, p. 75). After you confirmed the message with , the instrument will return to the mode it was in before asking for the password.

Cancel

Cancel the password entry and return without proceeding to the protected options and commands.



Information
03 Jun, 11:13
Closed Padlock
OK

Information

The password you entered was wrong.

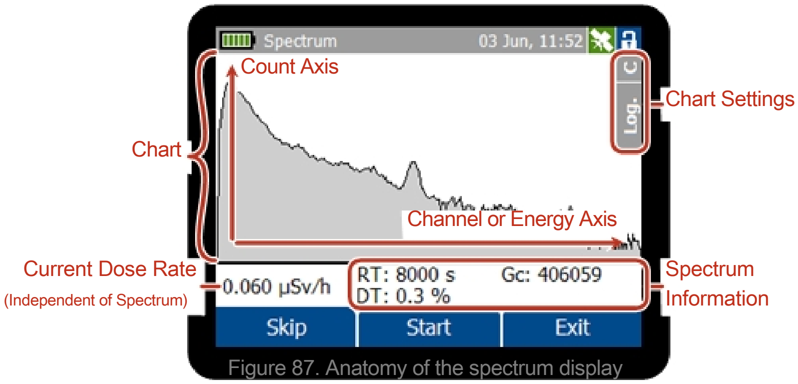
Figure 86. Message after entering a wrong password.

4.7 SHOW SPECTRUM

Options Menu (p. 69) ➢ More Options (p. 69) ➢ Show Spectrum Live

Spectrum (p. 192)

This command displays a spectrum and offers access to the settings that influence the display. You can acquire data ad hoc or load saved spectra from the database and inspect them with different scalings.



Spectrum
03 Jun, 11:52
Count Axis
Chart Settings
C
Log.
Chart
Channel or Energy Axis
Current Dose Rate
(Independent of Spectrum)
Spectrum
Information
Skip
Start
Exit

0.060 µSv/h

RT: 8000 s Gc: 406059

DT: 0.3 %

Figure 87. Anatomy of the spectrum display

The largest part of the screen is used for the spectrum chart (Figure 87, p. 75). Various status information is shown below and in the upper right of the chart (Figure 88, p. 76).

Acquisition Duration

The time passed while acquiring data for the spectrum as real or live time.

Dead Time

The dead time as a percentage of the real time.

Gamma Count

The total gamma counts comprising the spectrum as it is shown, that is, the Raw ⇌ Corrected setting (see below) affects this value.

Neutron Count

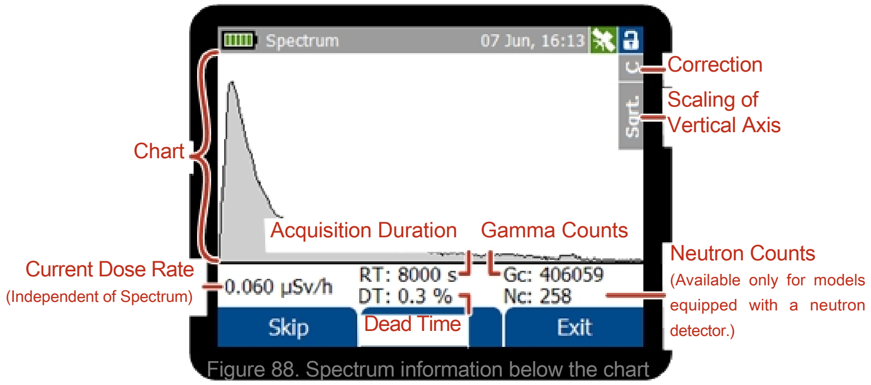
The total number of neutrons counted while aquiring data for the spectrum. (Available only for models equipped with a neutron detector.)

Correction

Indicates whether the spectrum is shown raw or corrected for the intrinsic background spectrum of the instrument, if any.

Scaling

The current scaling of the vertical axis (linear, logarithmic, square root).



Spectrum 07 Jun, 16:13

0.060 µSv/h

RT: 8000 s

DT: 0.3 %

Gc: 406059

Nc: 258

C
Sqrt.
Skip
Exit
Correction
Scaling of
Vertical Axis
Chart
Acquisition Duration
Gamma Counts
Neutron Counts
(Available only for models equipped with a neutron detector.)
Current Dose Rate
(Independent of Spectrum)
Dead Time

Figure 88. Spectrum information below the chart

SETTINGS AND COMMANDS

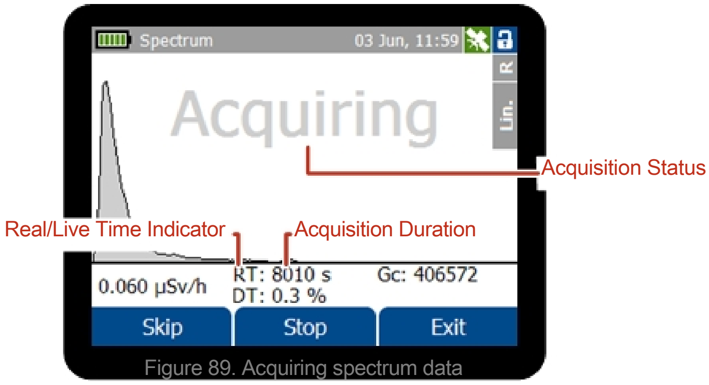
Skip

Cycle the list of commands with (see 2.2.2, p. 22).

Press to exit to the superior screen.

Start ⇌ Stop

Start or stop the acquisition of data for the spectrum with M . The current status is shown in the center of the chart (Figure 89, p. 77), which updates live with the acquired data.



0.060 µSv/h RT: 8010 s Gc: 406572
DT: 0.3 %

Acquisition Status

Real/Live Time Indicator

Acquisition Duration

Figure 89. Acquiring spectrum data

You cannot start the acquisition if the duration you preset (see 4.13, p. 91) for acquisition has ended. This is indicated by a remaining acquisition duration (Figure 90, p. 78) of 0. If you try to start nevertheless, your ICx identiFINDER 2 beeps.

The current spectrum is not cleared before recording data, that is, new measurements are added to the existing spectrum. To record a pristine spectrum, use the Clear command first (see below).

The acquisition of spectrum data does not stop if you Exit the spectrum view (see below). You can use your ICx identiFINDER 2 as usual. The acquisition of spectrum data stops in one of the following events:

- You end the acquisition with Stop
- The end of the real or life duration you specified (see 4.13, p. 91) is reached. You know the duration is preset because of the indicator (Figure 90, p. 78) and the timer is counting down.

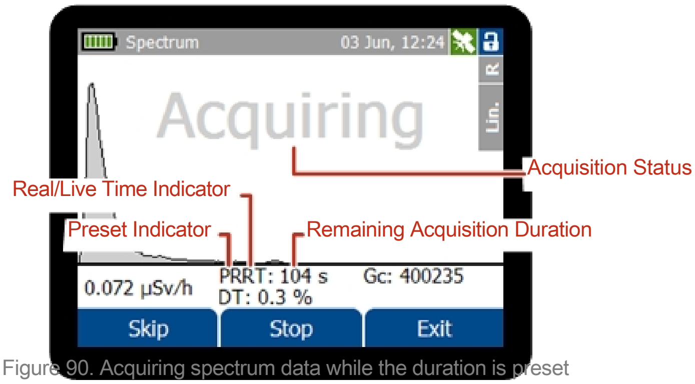

Spectrum
03 Jun, 12:24
R
Lin.
Acquiring
Acquisition Status
Real/Live Time Indicator
Preset Indicator
Remaining Acquisition Duration
0.072 µSv/h
PRRT: 104 s
DT: 0.3 %
Gc: 400235
Skip
Stop
Exit

Figure 90. Acquiring spectrum data while the duration is preset

- You switch the ICx identiFINDER 2 to Identification Mode (see 4.3, p. 60). This discards the current spectrum and loads the spectrum from the identification process into the spectrum viewer.

Exit

Return to the superior menu with R

Spectrum Cursor

You can place a cursor for detailed inspection along the spectrum's horizontal axis. The cursor position is represented on screen by a vertical line with a down-pointing triangle on top (Figure 91, p. 79). The number of counts at the cursor's position is shown above the triangle together with the position as channel number (Figure 91, p. 79) or energy (Figure 94, p. 82).

The vertical scaling is adjusted to make best use of the available screen height. If you **Zoom In** (see below), this may cause vertical rescaling if you move the cursor between sections with high peaks or noise.

Cursor Left

Move the cursor to the left with M . If you pass the left edge, the cursor wraps around to the right edge.

Cursor Right

Move the cursor to the right with R. If you pass the right edge, the cursor wraps around to the left edge.

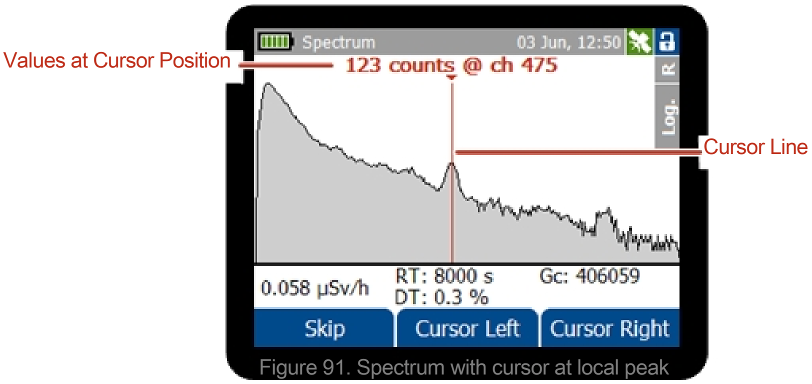

Values at Cursor Position
Spectrum
03 Jun, 12:50
123 counts @ ch 475
R
Log.
Cursor Line
0.058 µSv/h
RT: 8000 s
DT: 0.3 %
Gc: 406059
Skip
Cursor Left
Cursor Right

Figure 91. Spectrum with cursor at local peak

Zoom In ⇌ **Zoom Out**

Choose a horizontal display scale with M.

You can either view the entire spectrum scaled into the available display width or a partial spectrum where one spectral line is represented by a line of one pixel width.

If you moved the cursor into the spectrum (see above), the ICx identiFINDER 2 tries to center the enlarged view at the cursor.

Clear

Clear the current spectrum with R. You have to confirm this command with **Clear** or change your mind with **Cancel**

⚠ This command clears the current spectrum but does not stop the current acquisition of data, if any.

Save

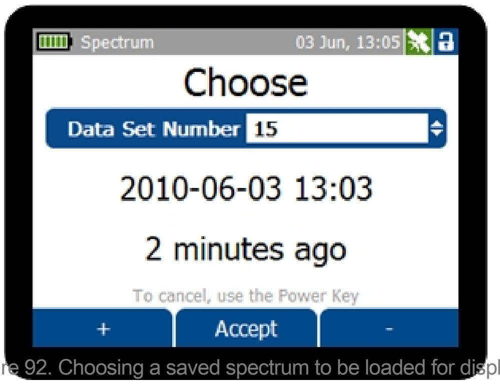
Save the current spectrum with M. The reference number of the saved spectrum will be shown until you acknowledge it with

If there is not enough free memory to store the spectrum, you will be informed. You can delete saved spectra (see 4.23, p. 108) if necessary.

Load

Load a saved spectrum with R

You can choose from all the saved spectra. While you step through the list, the saving date of the spectrum is displayed (Figure 92, p. 80) to assist you with making a selection.



Choose

Data Set Number 15

2010-06-03 13:03

2 minutes ago

To cancel, use the Power Key

Figure 92. Choosing a saved spectrum to be loaded for display

To cancel loading a spectrum press

If you load a spectrum while acquiring data, the current spectrum is discarded but the acquisition is not stopped. That is, fresh data are added to the loaded spectrum.

Identify

Let the ICx identiFINDER 2 apply its identification algorithm to the current spectrum with **M**.

The background subtraction setting (see below) is ignored by the identification algorithm. The instrument's intrinsic background spectrum, if any, is always subtracted before identification.

A list of identified nuclides, if any, is displayed and saved (Figure 93, p. 81).

Nuclides the identification algorithm did not recognize or those recognized but having their visibility suppressed (see 4.10, p. 87) are reported as “ Unknown” .

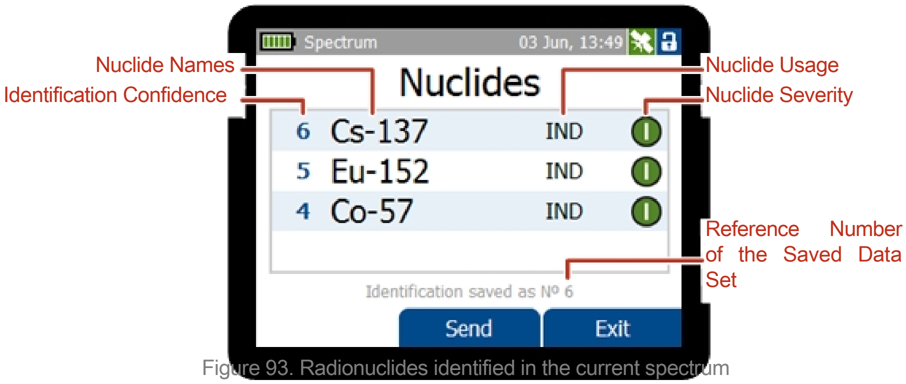
You can specify whether confidence, usage, or severity are shown, see 4.9, p. 85.

Exit

Return to the spectrum display.

Send

Go to **Send Identification** (see 4.31, p. 118) with **M** avoid-



Nuclides

6	Cs-137	IND	●
5	Eu-152	IND	●
4	Co-57	IND	●

Identification saved as Nº 6

Figure 93. Radionuclides identified in the current spectrum

ing the detour around the normal options menu hierarchy. The current identification will be already chosen for sending.

Raw ⇌ Corrected

Toggle the correction of the displayed spectrum for the instrument's intrinsic activity spectrum with

This command needs an intrinsic activity spectrum and hence is available only for instruments with a built-in calibration source or a lanthanum bromide detector crystal. The intrinsic activity spectrum is recorded in a lead shield during the manufacturing process.

The correction affects only the spectrum display, saving a spectrum (see above) always saves the original measured spectrum and the spectrum of the intrinsic activity for later processing.

The status of the correction is indicated in the top right corner of the chart by a " C" for corrected or an " R" for raw data (Figure 94, p. 82).

⇌ ⇌

Cycle the methods for the vertical scaling with . The current method is indicated in the top right corner of the chart (Figure 94, p. 82). The method you get after pressing is shown in the key description.

The vertical scaling is adjusted to make best use of the available screen height.

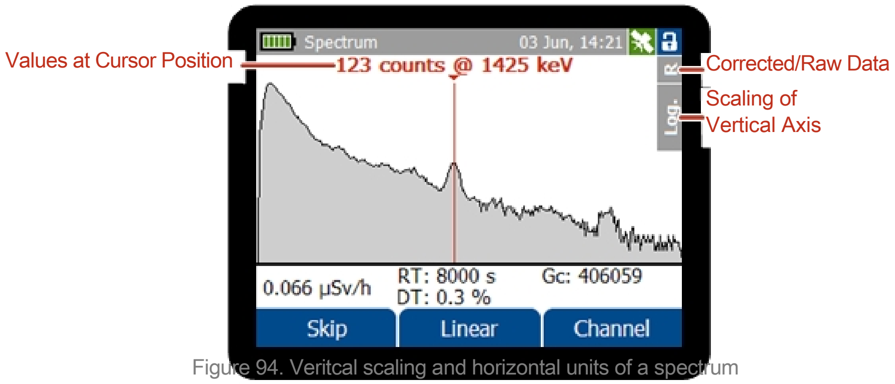

Values at Cursor Position
Corrected/Raw Data
Scaling of Vertical Axis
Spectrum
03 Jun, 14:21
123 counts @ 1425 keV
R
Log.
0.066 µSv/h
RT: 8000 s
DT: 0.3 %
Gc: 406059
Skip
Linear
Channel

Figure 94. Veritcal scaling and horizontal units of a spectrum

Energy ⇌ **Channel**

Cycle the options for the display of cursor positions in the spectrum with . The current unit is shown above the cursor (Figure 94, p. 82 and Figure 89, p. 77). The variant you get after pressing is shown in the key description (Figure 94, p. 82).

Calibration

View a detail spectrum to check the calibration with M. Please refer to 4.8, p. 83 for details.

LT ⇌ **RT**

Specify the type of display for the duration of data acquisition with R.

You can specify real or live time display. The current setting is shown below the chart (Figure 89, p. 77).

No matter what you specify here, the dead time (DT) is always shown as a percentage of the real time.

Send

Save the spectrum and go to **Send Spectrum** (see 4.32, p. 121) with M avoiding the detour around the normal options menu hierarchy. The current spectrum will be already chosen for sending.

Preset

Go to the **Presets** (see 4.13, p. 91) with R avoiding the detour around the normal options menu hierarchy.

4.8 CALIBRATION CHECK

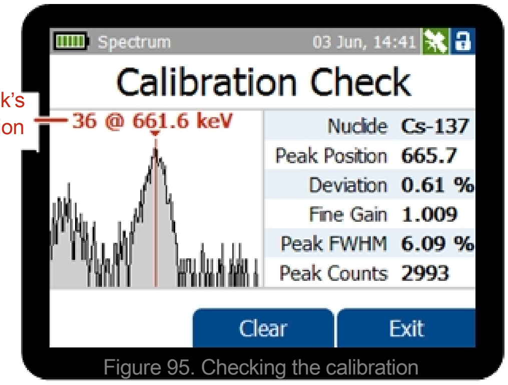
Options Menu (p. 69) ➢ More Options (p. 69) ➢ Show Spectrum (p. 75) ➢ Calibration Check

The calibration check screen (Figure 95, p. 83) shows a spectrum (see 4.7, p. 75) zoomed around the theoretical position of the peak of the radionuclide you specified to be used for calibration (see 4.28, p. 111) and some parameters describing the peak.

Data for this spectrum are continuously acquired beginning with an empty spectrum upon entering this screen or after you cleared the data (see below).

If your model needs an external source for calibration make sure it is present when using this command.

For best results, move the instrument to a low-radiation environment to check the calibration.



Counts at the Peak's Theoretical Position

Calibration Check

36 @ 661.6 keV

Nuclide	Cs-137
Peak Position	665.7
Deviation	0.61 %
Fine Gain	1.009
Peak FWHM	6.09 %
Peak Counts	2993

Figure 95. Checking the calibration

SETTINGS AND COMMANDS

Nuclide

The nuclide used for calibration depending on the type of your ICx identiFINDER 2, refer to Table 1, p. 84.

Peak Position

The position of the measured peak (keV).

Table 1. Typical Calibration Peaks

Nuclide	Peak	
^{40}K	1460.8 keV	Use the potassium chloride (KCl) box supplied with your instrument.
^{137}Cs	661.65 keV	Built into the instrument.
^{138}L}	1468 keV	Intrinsic activity of a LaBr$_3$ detector crystal.

Deviation

The measured peak’s position deviation from the theoretical position.

Fine Gain

Fine gain is the software amplification applied to correct deviations between the measured and the theoretical peak positions. The fine gain depends on the temperature, age and history of the detector crystal.

The optimal value at “ room temperature” is 1. You will be alerted if the fine gain is outside the optimal range set at the factory. You should contact your service provider if that happens (see A.3, p. 237).

Peak FWHM

The full width at half maximum height of the measured peak.

Peak Counts

The total number of counts within the identified peak since the beginning of data acquisition.

Clear

Clear the aquired data with . The acquisition of data is not interrupted.

Exit

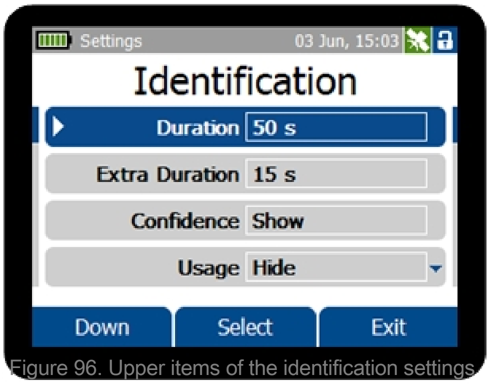
Return to the superior menu with

4.9 IDENTIFICATION SETTINGS

Options Menu (p. 69) ➢ More Options (p. 69) ➢ Identification Options (p. 69) ➢ Identification Settings

Settings (p. 164) ➢ General (p. 168) ➢ Identification (p. 170)

This screen (Figure 96, p. 85) groups options that influence the identification of nuclides (see 4.3, p. 60).



Identification

Duration 50 s

Extra Duration 15 s

Confidence Show

Usage Hide

Figure 96. Upper items of the identification settings

SETTINGS AND COMMANDS

Duration

Specify the duration of data acquisition for the nuclide identification. Allot more time to the identification measurement if

- you want to identify a weak source.
- you are at a place with high background radiation.
- you want to identify a mixture of radio nuclides.
- you want to identify a shielded source.

You can specify the durations “ Dynamic” and 1-999 seconds (16 m 39 s).

If you specify a duration of “ Dynamic” , the ICx identiFINDER 2 will collect data until 8000 gamma counts have been registered. This may take a while especially if the radiation level is near the background level.

Extra Duration

Specify the duration of continued data acquisition for the nuclide identification. This duration is applied when you use the **Continue** command in identification mode (see 4.3, p. 60), no matter whether you specified the duration or the minimum number of counts above.

You can specify an extra duration from 1 to 999 seconds (16 m 39 s).

Confidence

Specify if you want the level of confidence of a nuclide identification shown or hidden in identification results. The confidence is expressed on a scale from 0 (poor) to 10 (excellent).

Usage

Specify if you want the usage (NORM, MED, IND, SNM) of an identified nuclide shown or hidden in identification results (for details refer to 4.11, p. 88 or B, p. 239).

Severity

Specify if you want the severity of an identified nuclide shown by icons or hidden in identification results (for details refer to 4.12, p. 89 or B, p. 239).

I Innocent

S Suspicious

T Threatening

Down, **Select**

Choose and select menu items, see 2.2.1, p. 20 for details.

+, **-**, **Accept**, ⏻

Change values, see 2.2.3, p. 23 for details.

Exit

Return to the superior menu with

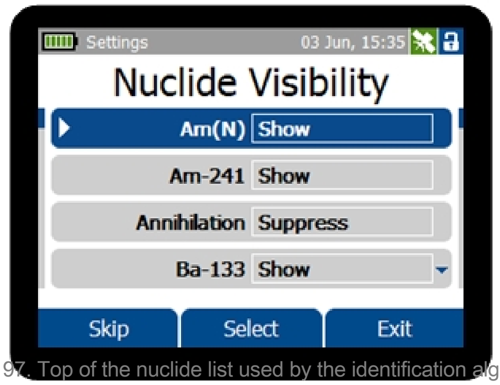
4.10 NUCLIDE VISIBILITY

Options Menu (p. 69) ➢ More Options (p. 69) ➢ Identification Options (p. 69) ➢ Nuclide Visibility

Settings (p. 164) ➢ Nuclides (p. 175)

Built into the ICx identiFINDER 2 is a library used to identify the nuclides causing gamma radiation. Please refer to Appendix B, p. 239 for further information about the nuclides in this library.

You can specify which nuclides should be included in the display of identification results (Figure 97, p. 87).



Nuclide Visibility

Am(N) Show
Am-241 Show
Annihilation Suppress
Ba-133 Show

Figure 97. Top of the nuclide list used by the identification algorithm

SETTINGS AND COMMANDS

Nuclides. . .

Choose one from the list of nuclides to specify whether you want it to be shown or suppressed in identification results.

Suppressed nuclides are reported as “ Unknown” if recognized by the identification algorithm.

The settings for some nuclides are grouped, for example, uranium isotope mixtures with differing compositions (reported as DU, LEU, HEU) share a common setting under ^{mix}U. See Appendix B, p. 239 for details and other examples.

Skip

Cycle the list of commands with (see 2.2.2, p. 22).

Down, Select

Choose and select menu items, see 2.2.1, p. 20 for details.

+, -, Accept,

Change values, see 2.2.3, p. 23 for details.

Exit

Return to the superior menu with

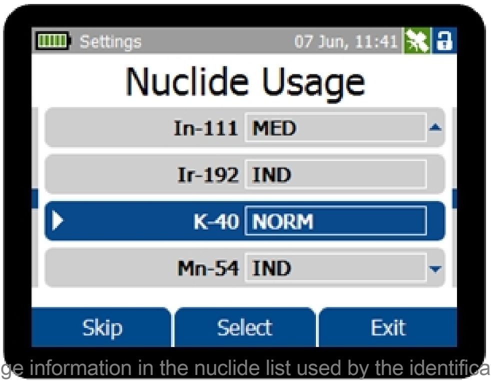
4.11 NUCLIDE USAGE

Options Menu (p. 69) ➢ More Options (p. 69) ➢ Identification Options (p. 69) ➢ Nuclide Usage

Settings (p. 164) ➢ Nuclides (p. 175)

Built into the ICx identiFINDER 2 is a library used to identify the nuclides causing gamma radiation. Please refer to Appendix B, p. 239 for further information about the nuclides in this library.

Every nuclide has associated information about its occurrence or field of application which you can have shown in identification results (Figure 75, p. 62). You can adapt the usage for all the nuclides in the library according to your needs with this command (Figure 98, p. 88).



Settings 07 Jun, 11:41

Nuclide Usage

In-111 MED

Ir-192 IND

K-40 NORM

Mn-54 IND

Figure 98. Usage information in the nuclide list used by the identification algorithm

SETTINGS AND COMMANDS

Nuclides. . .

Choose one from the list of nuclides to edit the associated usage.

NORM	Naturally occurring radioactive material
MED	Medically used material
IND	Industrially used material
SNM	Special nuclear material

The settings for some nuclides are grouped, for example, uranium isotope mixtures with differing compositions (reported as DU, LEU, HEU) share a common setting under ^{mix}U. See Appendix B, p. 239 for details and other examples.

Skip

Cycle the list of commands with (see 2.2.2, p. 22).

Down, **Select**

Choose and select menu items, see 2.2.1, p. 20 for details.

+, **-**, **Accept**,

Change values, see 2.2.3, p. 23 for details.

Left, **Right**

Edit composite values, see 2.2.4, p. 25 for details.

Exit

Return to the superior menu with

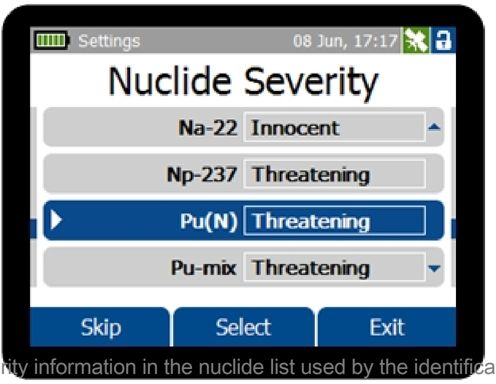
4.12 NUCLIDE SEVERITY

Options Menu (p. 69) ➢ More Options (p. 69) ➢ Identification Options (p. 69) ➢ Nuclide Severity

Settings (p. 164) ➢ Nuclides (p. 175)

Built into the ICx identiFINDER 2 is a library used to identify the nuclides causing gamma radiation. Please refer to Appendix B, p. 239 for further information about the nuclides in this library.

Every nuclide has associated information about its potential danger which you can have shown in identification results (Figure 75, p. 62). You can adapt the severity for all the nuclides in the library according to your needs with this command (Figure 99, p. 90).


Settings 08 Jun, 17:17

Nuclide Severity

Na-22 Innocent

Np-237 Threatening

Pu(N) Threatening

Pu-mix Threatening

Figure 99. Severity information in the nuclide list used by the identification algorithm

SETTINGS AND COMMANDS

Nuclides. . .

Choose one from the list of nuclides to edit the associated attributes.

I Innocent

S Suspicious

T Threatening

The settings for some nuclides are grouped, for example, uranium isotope mixtures with differing compositions (reported as DU, LEU, HEU) share a common setting under ^{mix}U. See Appendix B, p. 239 for details and other examples.

Skip

Cycle the list of commands with (see 2.2.2, p. 22).

Down, **Select**

Choose and select menu items, see 2.2.1, p. 20 for details.

+, **-**, **Accept**,

Change values, see 2.2.3, p. 23 for details.

Left, **Right**

Edit composite values, see 2.2.4, p. 25 for details.

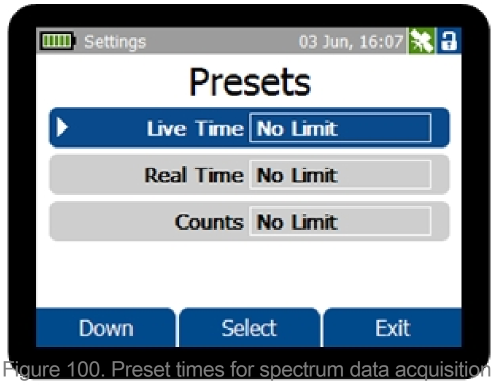
Exit

Return to the superior menu with

4.13 PRESETS

Options Menu (p. 69) ➢ More Options (p. 69) ➢ Presets

This screen (Figure 100, p. 91) groups options that influence the data acquisition for spectra (4.7, p. 75).



Presets

Live Time No Limit

Real Time No Limit

Counts No Limit

Figure 100. Preset times for spectrum data acquisition

You can stop the data acquisition for spectra manually or have it stop automatically after a duration or a number of counts you specify here.

⚠ You can preset either one of these limits. If you try to enter a second preset, the others will be set to " No Limit" .

Preset limits remain in effect until you change them or switch off your ICx identiFINDER 2.

SETTINGS AND COMMANDS

Real Time

Specify the duration of data acquisition as real time. You can specify durations up to 43200 seconds (12 h) or " No Limit" .

Live Time

Specify the duration of data acquisition as live time. You can specify durations up to 43200 seconds (12 h) or " No Limit" .

Counts
Specify the number of counts to be aquired. You can specify values from 100 to 9 999 900 in steps of 100 or " No Limit" .

If you preset the number of counts, the current number of raw counts is shown below the spectrum screen (Figure 89, p. 77) while acquiring data, that is, the shown number is not affected by the **Raw** ⇌ **Corrected** setting (4.7, p. 75).

Down, **Select**
Choose and select menu items, see 2.2.1, p. 20 for details.

+, **-**, **Accept**, ⏻
Change values, see 2.2.3, p. 23 for details.

Exit
Return to the superior menu with R

4.14 RECALIBRATE

Options Menu (p. 69) ➢ More Options (p. 69) ➢ Recalibrate

This command starts the normal calibration procedure of the ICx identiFINDER 2.

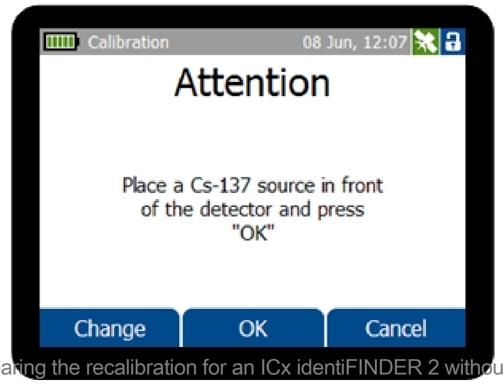
Due to the advanced internal calibration and stabilization technology of the ICx identiFINDER 2, it is not necessary to routinely calibrate the instrument. You can, however, re-calibrate the ICx identiFINDER 2 as one item on your quality assurance checklist.

If your model of the ICx identiFINDER 2 has no radiation source built in, you will be prompted to place the calibration source specified under 4.28, p. 111 in front of your ICx identiFINDER 2 (Figure 101, p. 93).

The calibration progress is displayed (Figure 102, p. 93).

You can **Cancel** the recalibration with R. The instrument will continue operation based on the previous calibration results.

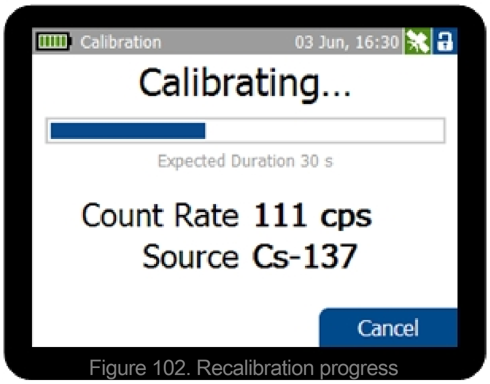
After the recalibration the results are displayed (Figure 103, p. 93).


Calibration 08 Jun, 12:07

Attention

Place a Cs-137 source in front of the detector and press "OK"

Figure 101. Preparing the recalibration for an ICx identiFINDER 2 without internal source


Calibration 03 Jun, 16:30

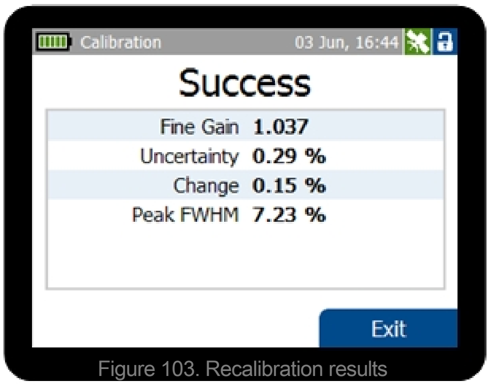
Calibrating...

Expected Duration 30 s

Count Rate **111 cps**

Source **Cs-137**

Figure 102. Recalibration progress


Calibration 03 Jun, 16:44

Success

Fine Gain	**1.037**
Uncertainty	**0.29 %**
Change	**0.15 %**
Peak FWHM	**7.23 %**

Figure 103. Recalibration results

SETTINGS AND COMMANDS

Change

Specify the nuclide of the external source with (see 4.28, p. 111).

OK

Start the calibration with M after you put the external source into position.

Fine Gain

Fine gain is the software amplification applied to correct deviations between the measured and the theoretical peak positions. The fine gain depends on the temperature, age and history of the detector crystal.

The optimal value at " room temperature" is 1. You will be alerted if the fine gain is outside the optimal range set at the factory. You should contact your service provider if that happens (see A.3, p. 237).

Uncertainty

The relative error of the fine gain.

Change

Change of the fine gain value compared to the previous calibration.

Peak FWHM

The full width at half maximum height of the measured peak.

Exit

Return to the superior menu with R

4.15 DISPLAY SETTINGS

Options Menu (p. 69) ➢ More Options (p. 69) ➢ Advanced Options (p. 70) ➢ General Options (p. 70) ➢ Display Settings

Settings (p. 164) ➢ General (p. 168) ➢ User Interface (p. 170)

This screen groups several options that influence the display of your ICx identiFINDER 2 (Figure 104, p. 95).

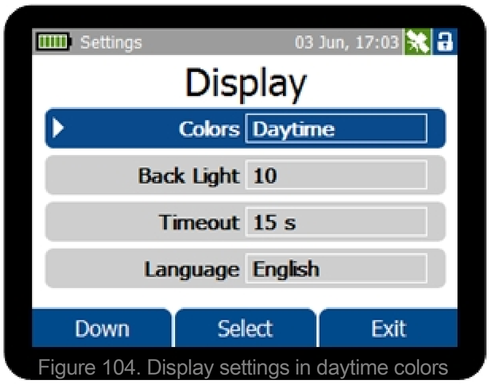
SETTINGS AND COMMANDS

Colors

Choose a color set for the display.

Daytime

Colors optimized for bright environments (Figure 104, p. 95).



Display

Colors Daytime

Back Light 10

Timeout 15 s

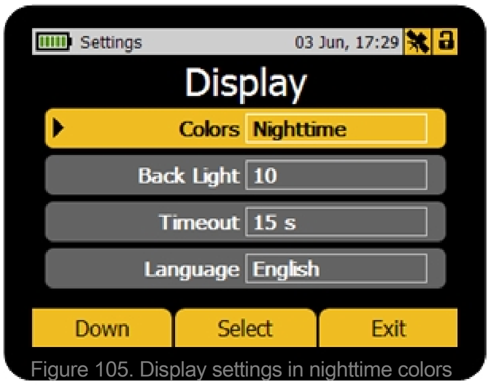
Language English

Figure 104. Display settings in daytime colors

Almost all screen shots in this manual were taken using this color set.

Nighttime

Colors optimized for dazzle-free reading in dark environments (Figure 105, p. 95).



Display

Colors Nighttime

Back Light 10

Timeout 15 s

Language English

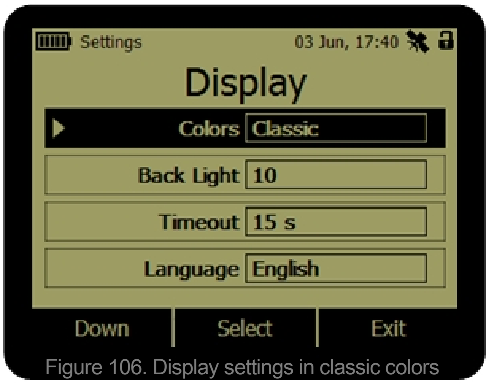
Figure 105. Display settings in nighttime colors

Classic

Colors mimicking the monochrome appearance of outdated instruments (Figure 106, p. 96).

Back Light

Specify the brightness of the display's backlight in steps between 0 (no backlight) and 10 (very bright).



Display

Colors Classic

Back Light 10

Timeout 15 s

Language English

Figure 106. Display settings in classic colors

Timeout

Specify the duration of user inactivity after which the display back light is switched off to save energy. You can choose from 15 s (the factory default) - 60 s - 5 min - Never.

💡 The back light draws a significant amount of power, you should let it time out while running on batteries.

💡 After the back light times out, you can reactivate it by shortly pressing any key. At this moment, the usual functions of short key presses are ignored.

Language

Choose a language to be used for the display.

English

English with American spelling

Deutsch

German

more languages. . .

⚠ Ensure you understand enough of the language you are changing to. It may be difficult to change back if you do not understand the menu language.

Down, **Select**

Choose and select menu items, see 2.2.1, p. 20 for details.

+, **-**, **Accept**,

Change values, see 2.2.3, p. 23 for details.

Exit

Return to the superior menu with

4.16 CLOCK SETTINGS

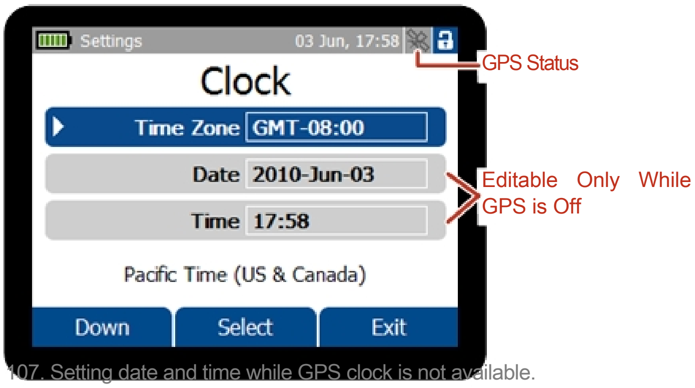
Options Menu (p. 69) ➢ More Options (p. 69) ➢ Advanced Options (p. 70) ➢ General Options (p. 70) ➢ Clock Settings

Settings (p. 164) ➢ General (p. 168) ➢ User Interface (p. 170)

You can check and change the settings of the ICx identiFINDER 2's clock in this screen (Figure 107, p. 97).

If the GPS receiver is switched on (see 4.18, p. 100), the received time sets the clock of the ICx identiFINDER 2 and the only setting you have to specify is your time zone.

If the clock setting seems unreasonable when switching on the ICx identiFINDER 2 (see 2.3, p. 31), for example after the batteries were completely empty for a while, this screen will show up and you will be asked to enter the correct date, time, and time zone settings.



Time Zone GMT-08:00

Date 2010-Jun-03

Time 17:58

Pacific Time (US & Canada)

Figure 107. Setting date and time while GPS clock is not available.

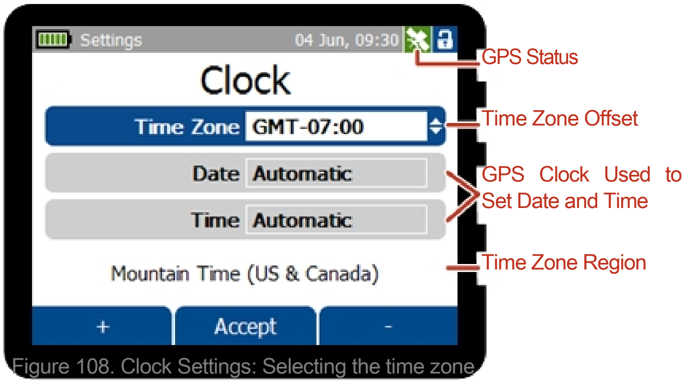
If GPS date and time information become available while you edit the date or time, editing will be cancelled and the GPS clock is used.

SETTINGS AND COMMANDS

Time Zone

Select your time zone from the list built into the ICx identiFINDER 2. Time zones are specified as offset from to UTC/GMT (Figures 108-109, p. 98-98).

Periods for daylight savings time, however, might be different for the same offset from UTC in various regions. To have the ICx identiFINDER 2 consider the correct daylight savings time for your time zone, make sure to check the region info when selecting the offset.



Settings 04 Jun, 09:30

Clock

Time Zone GMT-07:00

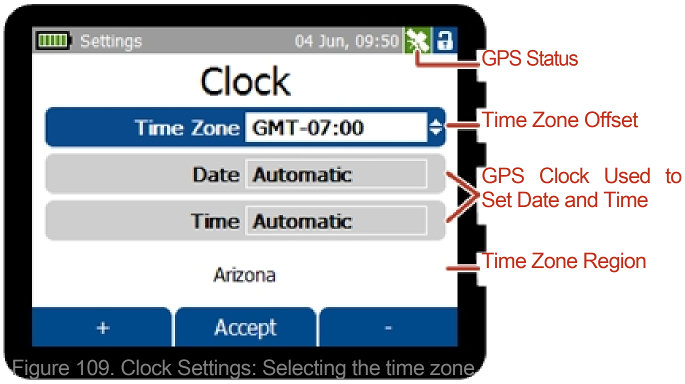
Date Automatic

Time Automatic

Mountain Time (US & Canada)

+
Accept
-
GPS Status
Time Zone Offset
GPS Clock Used to Set Date and Time
Time Zone Region

Figure 108. Clock Settings: Selecting the time zone



Settings 04 Jun, 09:50

Clock

Time Zone GMT-07:00

Date Automatic

Time Automatic

Arizona

+
Accept
-
GPS Status
Time Zone Offset
GPS Clock Used to Set Date and Time
Time Zone Region

Figure 109. Clock Settings: Selecting the time zone

Date

Specify year, month and day of the current date.

Time

Specify hours and minutes of the current time.

The time is specified in 24-hour format (ISO 8601).

Down, **Select**

Choose and select menu items, see 2.2.1, p. 20 for details.

+, **-**, **Accept**,

Change values, see 2.2.3, p. 23 for details.

Left, **Right**

Edit composite values, see 2.2.4, p. 25 for details.

Exit

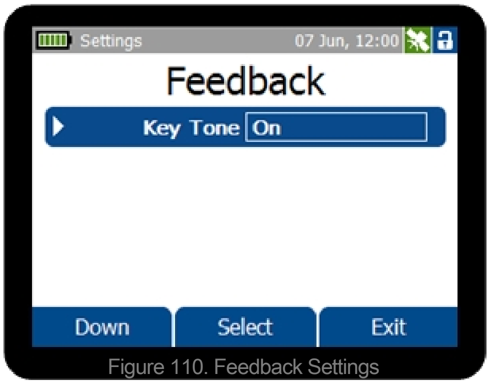
Return to the superior menu with

4.17 FEEDBACK SETTINGS

Options Menu (p. 69) ➢ More Options (p. 69) ➢ Advanced Options (p. 70) ➢ General Options (p. 70) ➢ Feedback Settings

Settings (p. 164) ➢ General (p. 168) ➢ User Interface (p. 170)

This screen (Figure 110, p. 99) groups settings regarding the ICx identiFINDER 2's reactions to your input.


Settings 07 Jun, 12:00

Feedback

Key Tone On

Figure 110. Feedback Settings

SETTINGS AND COMMANDS

Key Tone

Specify whether a short beep should accompany every key press.

Down, **Select**

Choose and select menu items, see 2.2.1, p. 20 for details.

+, **-**, **Accept**,

Change values, see 2.2.3, p. 23 for details.

Exit

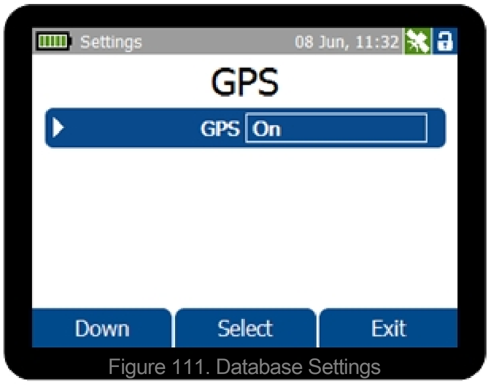
Return to the superior menu with

4.18 GPS SETTINGS

Options Menu (p. 69) ➢ More Options (p. 69) ➢ Advanced Options (p. 70) ➢ General Options (p. 70) ➢ GPS Settings

Settings (p. 164) ➢ General (p. 168) ➢ GPS (p. 170)

This screen (Figure 111, p. 100) groups settings regarding the ICx identiFINDER 2's GPS receiver.



GPS

GPS On

Figure 111. Database Settings

SETTINGS AND COMMANDS

GPS

Switch the GPS receiver On or Off (factory default).

The GPS receiver draws a significant amount of power, you should switch it off if you don't need it, especially while running on batteries.

If the GPS receiver is on and the reception is good enough, the GPS coordinates of the current location are stored with alarms, spectra, identification results etc.

If the GPS reception is not good enough, for example inside buildings, the current location cannot be determined. If a location could be determined from GPS data since you switched on the ICx identiFINDER 2, the last valid location is used. Otherwise, the position of the intersection of the Greenwich Meridian with the Equator is used (0° N, 0° E).

Additionally, the clock of the ICx identiFINDER 2 is set according to the high-precision time received from the GPS satellites (see 4.16, p. 97).

Down, **Select**
Choose and select menu items, see 2.2.1, p. 20 for details.

+, **-**, **Accept**, ⏻
Change values, see 2.2.3, p. 23 for details.

Exit
Return to the superior menu with R

4.19 SET PASSWORD

Options Menu (p. 69) ➢ More Options (p. 69) ➢ Advanced Options (p. 70) ➢ Maintenance (p. 70) ➢ Change Password (p. 70) ➢ Set Password

The password set at the factory, if any, is LMRLMRL. For better protection against accidental changes of the instrument characteristics, you should change the password to something else. If you don't need protection but want faster access to the menus, you can remove the password (4.20, p. 102).

■ Make sure to remember the password you set. There is no way to access the protected options and commands without it. A password cannot be deciphered at the factory.

This command lets you enter a new password (Figure 112, p. 102) consisting of seven characters from the pool , M, and

To cancel the entry of the password press ⏻

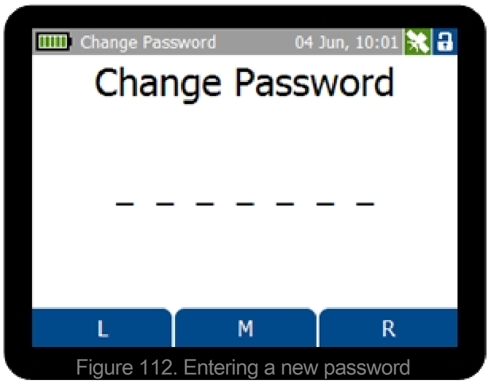

Change Password
04 Jun, 10:01
Change Password
_ _ _ _ _ _ _
L
M
R

Figure 112. Entering a new password

After your entry is complete (Figure 113, p. 102), you can activate the password with Chan mapped to M or C the password modification with

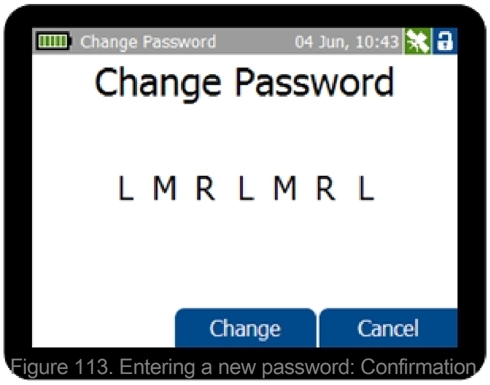

Change Password
04 Jun, 10:43
Change Password
L M R L M R L
Change
Cancel

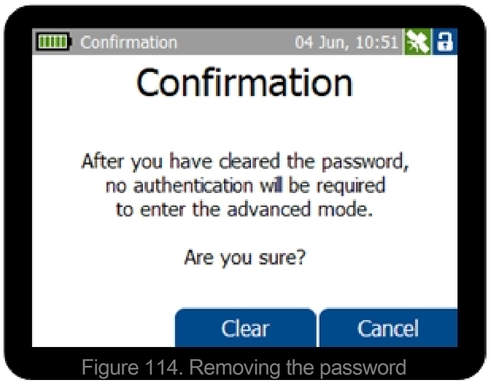
Figure 113. Entering a new password: Confirmation

4.20 CLEAR PASSWORD

Options Menu (p. 69) ➢ More Options (p. 69) ➢ Advanced Options (p. 70) ➢ Maintenance (p. 70) ➢ Change Password (p. 70) ➢ Clear Password

This command clears the password. All commands normally requiring a password to be accessed will be freely available.

You have to confirm this command with Clear or can change your mind with Cancel (Figure 114, p. 103).



Confirmation

After you have cleared the password,
no authentication will be required
to enter the advanced mode.

Are you sure?

Figure 114. Removing the password

4.21 SHOW STATUS

Options Menu (p. 69) ➢ More Options (p. 69) ➢ Advanced Options (p. 70) ➢ Maintenance (p. 70) ➢ Show Status

Home (p. 164) ➢ Info (p. 166) ➢ System (p. 166)

This command displays various status and version information for your ICx identiFINDER 2 on several pages (Figures 115-117, p. 104-105).

SETTINGS AND COMMANDS

System ⇌ Versions ⇌ GPS ⇌ Calibration

Step through the status pages with M.

System

Various information about your ICx identiFINDER 2 (Figure 115, p. 104).

Serial Number

The serial number of your ICx identiFINDER 2.

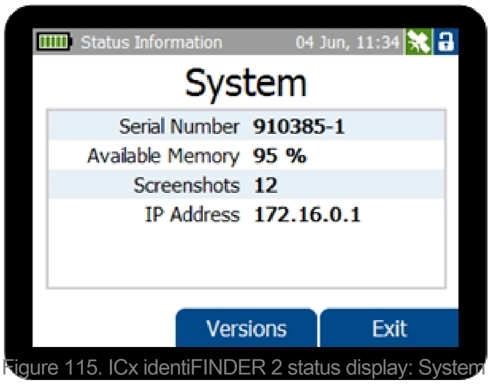
Available Memory

The capacity remaining to store spectra, alarms, logged data, and screenshots.

You can free memory by erasing all or some of the data (see 4.23, p. 108 ff.) if necessary.

Screenshots

The number of screen shots saved in memory.


Status Information
04 Jun, 11:34
Versions
Exit

System

Serial Number 910385-1
Available Memory 95 %
Screenshots 12
IP Address 172.16.0.1

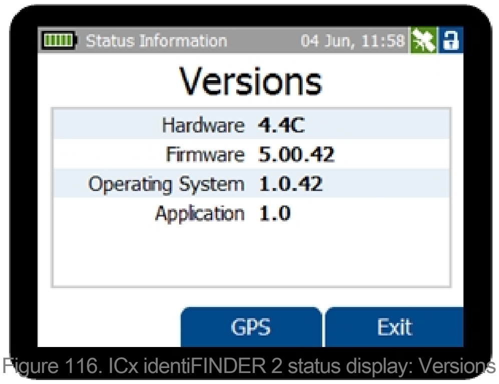
Figure 115. ICx identiFINDER 2 status display: System

IP Address

The IP address of your ICx identiFINDER 2. You need this address to communicate with the instrument from a computer (see 4.36, p. 129).

Versions

Versions of various components of the ICx identiFINDER 2 (Figure 116, p. 104).


Status Information
04 Jun, 11:58
GPS
Exit

Versions

Hardware 4.4C
Firmware 5.00.42
Operating System 1.0.42
Application 1.0

Figure 116. ICx identiFINDER 2 status display: Versions

Hardware

The version of the hardware.

Firmware

The version of the firmware.

Operating System

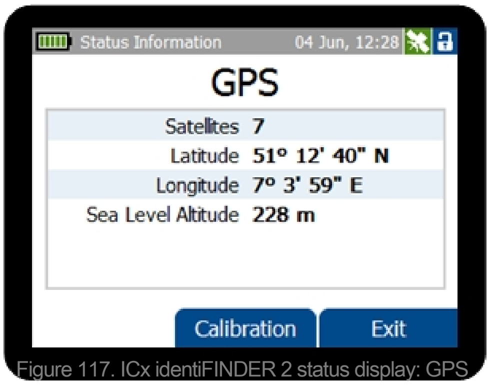
The version of the operating system.

Application

The version of the application software.

GPS

Your current location determined from the GPS data received by the ICx identiFINDER 2 (Figure 117, p. 105).



Satellites	7
Latitude	51° 12' 40" N
Longitude	7° 3' 59" E
Sea Level Altitude	228 m

Figure 117. ICx identiFINDER 2 status display: GPS

The GPS status data are shown only if the GPS receiver is switched on (see 4.18, p. 100).

Satellites

The number of satellites currently “ visible” to the ICx identiFINDER 2. The more satellites, the better the precision of the location data.

⚠ If this number drops below 3, the given location is invalid. It is either the most recent valid location, or, if there was no valid location since you switched on the ICx identiFINDER 2, the intersection of the Greenwich meridian and the equator.

Latitude

The current location north or south of the equator given in angle degrees, minutes and seconds.

Longitude

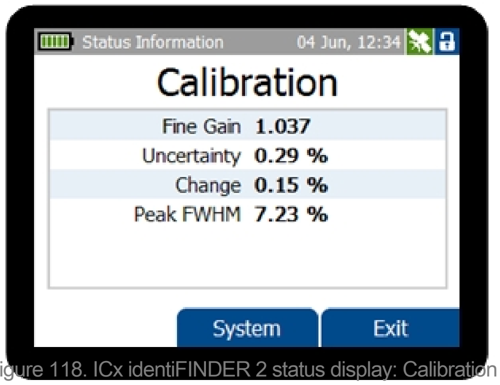
The current location west or east of the prime meridian passing through the Royal Observatory in Greenwich (UK) given in angle degrees, minutes and seconds.

Altitude

The current altitude in meters above or below the mean sea level as defined by the WGS84 geoid used by GPS.

Calibration

The results of the last successful calibration (Figure 118, p. 106).



Status Information 04 Jun, 12:34

Calibration

Fine Gain	1.037
Uncertainty	0.29 %
Change	0.15 %
Peak FWHM	7.23 %

Figure 118. ICx identiFINDER 2 status display: Calibration

Fine Gain

Fine gain is the software amplification applied to correct deviations between the measured and the theoretical peak positions. The fine gain depends on the temperature, age and history of the detector crystal.

The optimal value at " room temperature" is 1. You will be alerted if the fine gain is outside the optimal range set at the factory. You should contact your service provider if that happens (see A.3, p. 237).

Uncertainty

The relative error of the fine gain.

Change

Change of the fine gain value compared to the previous calibration.

Peak FWHM

The full width at half maximum height of the measured peak.

Exit

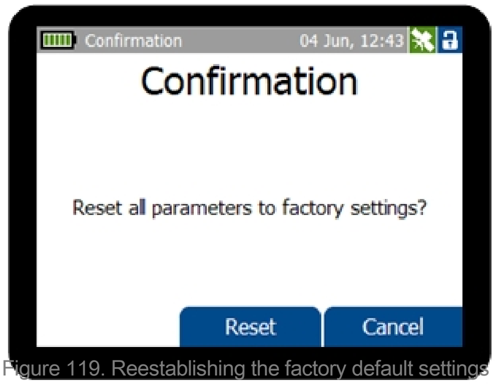
Return to the superior menu with R

4.22 RESET FACTORY SETTINGS

Options Menu (p. 69) ➢ More Options (p. 69) ➢ Advanced Options (p. 70) ➢ Maintenance (p. 70) ➢ Reset Factory Settings

This command (Figure 119, p. 107) discards all changes you made to any of the ICx identiFINDER 2's settings and reestablishes the settings made at the factory.

⚠ The password (see 4.6, p. 73), if any, is reset to the factory setting as well.



Confirmation 04 Jun, 12:43

Confirmation

Reset all parameters to factory settings?

Figure 119. Reestablishing the factory default settings

SETTINGS AND COMMANDS

Reset

Discard all your personal settings and return to the factory default settings with M.

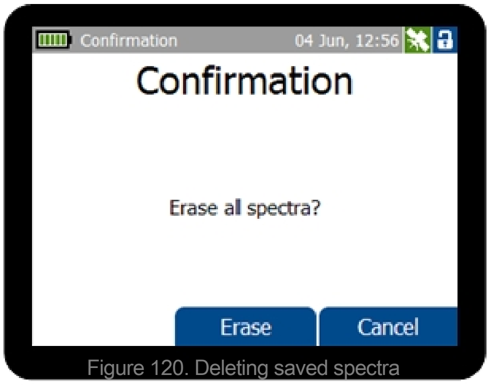
Cancel

Keep the current settings and return to the superior menu with

4.23 ERASE ALL SPECTRA

Options Menu (p. 69) ➢ More Options (p. 69) ➢ Advanced Options (p. 70) ➢ Maintenance (p. 70) ➢ Erase Data (p. 70) ➢ Erase All Spectra

This command (Figure 120, p. 108) deletes all spectra saved in the ICx identiFINDER 2's database including min/max/average for dose and neutron, GPS location, and identification, if any.



Confirmation

Erase al spectra?

Figure 120. Deleting saved spectra

SETTINGS AND COMMANDS

Erase

Delete all saved spectra with M.

Cancel

Keep the saved spectra and return to the superior menu with

4.24 ERASE ALL ALARMS

Options Menu (p. 69) ➢ More Options (p. 69) ➢ Advanced Options (p. 70) ➢ Maintenance (p. 70) ➢ Erase Data (p. 70) ➢ Erase All Alarms

This command (compare Figure 120, p. 108) deletes all alarms saved in the ICx identiFINDER 2's permanent memory.

SETTINGS AND COMMANDS

Erase

Delete all saved alarms with M.

Cancel

Keep the saved alarms and return to the superior menu with

4.25 ERASE ALL DATA LOGGING ENTRIES

Options Menu (p. 69) ➢ More Options (p. 69) ➢ Advanced Options (p. 70) ➢ Maintenance (p. 70) ➢ Erase Data (p. 70) ➢ Erase All Data Logging Entries

This command (compare Figure 120, p. 108) deletes all data saved by the data logger from the ICx identiFINDER 2's permanent memory.

SETTINGS AND COMMANDS

Erase

Delete all logged data with M .

Cancel

Keep the logged data and return to the superior menu with

4.26 ERASE ALL SCREENSHOTS

Options Menu (p. 69) ➢ More Options (p. 69) ➢ Advanced Options (p. 70) ➢ Maintenance (p. 70) ➢ Erase Data (p. 70) ➢ Erase All Screenshots

This command (compare Figure 120, p. 108) deletes all screenshots saved in the ICx identiFINDER 2's permanent memory.

SETTINGS AND COMMANDS

Erase

Delete all screenshots with M .

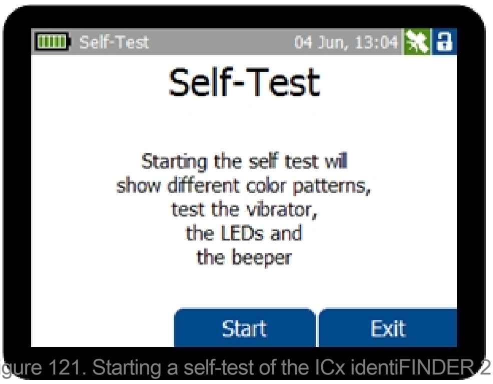
Cancel

Keep the screenshots and return to the superior menu with

4.27 FACTORY TESTS

Options Menu (p. 69) ➢ More Options (p. 69) ➢ Advanced Options (p. 70) ➢ Maintenance (p. 70) ➢ Factory Tests

This command tests the display screen and activates all the alarm annunciators to demonstrate their proper operation.



Self-Test

Starting the self test will
show different color patterns,
test the vibrator,
the LEDs and
the beeper

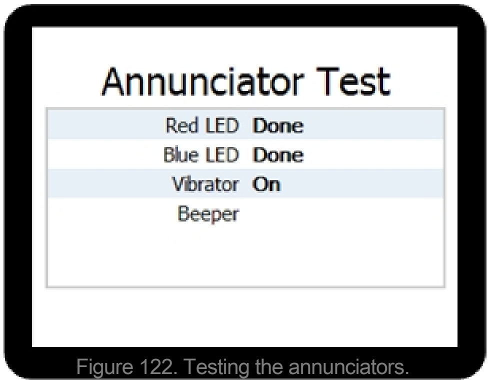
Figure 121. Starting a self-test of the ICx identiFINDER 2.

SETTINGS AND COMMANDS

Start

Start the test with M. The display should show several test patterns in the main colors red, green and blue.

Further tests regard the alarm LEDs on the front side, the vibrator, and the beeper. Follow the list of tests displayed (Figure 122, p. 110) and verify that the annunciators are working.



Annunciator Test

Red LED	**Done**
Blue LED	**Done**
Vibrator	**On**
Beeper	

Figure 122. Testing the annunciators.

Exit

Return to the superior menu with R

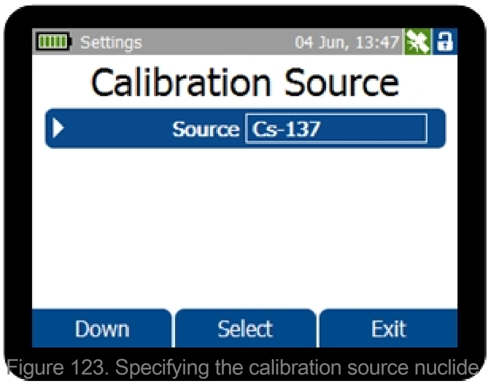
4.28 CALIBRATION SOURCE

Options Menu (p. 69) ➢ More Options (p. 69) ➢ Advanced Options (p. 70) ➢ Calibration Source

Settings (p. 164) ➢ General (p. 168) ➢ Measurement (p. 169)

This command is available only for ICx identiFINDER 2 variants (A.1, p. 231) without a built-in calibration source.

You can use various reference nuclides to calibrate the ICx identiFINDER 2 with an external source. Use this setting to specify the nuclide to be used (Figure 123, p. 111).



Source Cs-137

Figure 123. Specifying the calibration source nuclide

^{137} Cs (Cesium)

^{137} Cs sources are probably at hand in most laboratories dealing with radioactivity. To obtain optimum calibration results, the source activity should be in the range 5-100 kBq (about 0.15-3 µCi). If necessary, change the distance between source and instrument in order to obtain the desired count rate. As a rule of thumb, place a source of 1 µCi about 5 cm (2 in) in front of the detector (Figure 124, p. 112). Place a source of 150 nCi directly on the detector.

^{40} K (Potassium)

^{40} K is a naturally occurring nuclide contributing significantly to the natural radiation background and can be used for detector re-calibration. However, the K concentration at most places of the

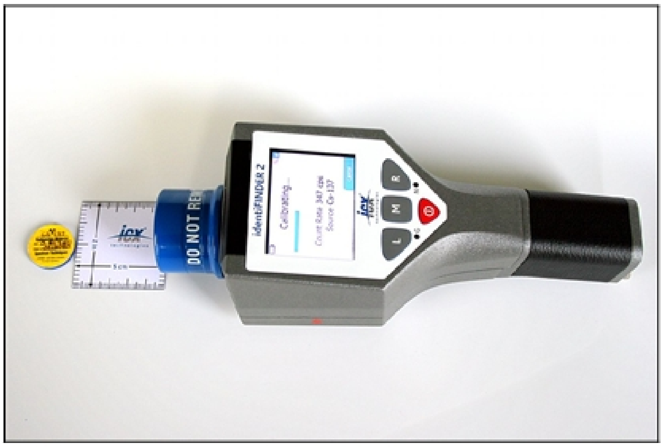

DO NOT RE
identiFINDER 2
Calibrating...
Count Rate 347 cps
Source Cs-137
R
M
L

Figure 124. The ICx identiFINDER 2 with an external ^{137}Cs source for calibration.

Earth's surface is low, hence the calibration measurement needs a lot of time. You can improve the quality of the calibration by increasing the amount of K in front of the detector with, for example, the KCl (potassium chloride) container (Figure 125, p. 112, Figure 236, p. 224) available with the ICx identiFINDER 2 or a pack of potassium mineral fertilizer.

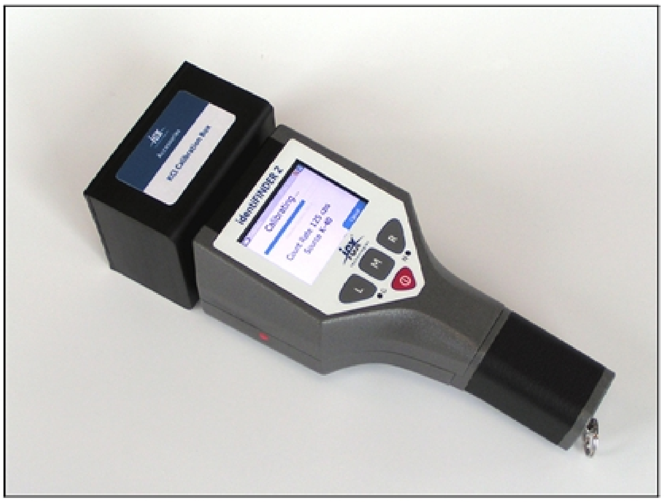

KCl Calibration Box
identiFINDER 2
Calibrating...
Count Rate 125 cps
Source K-40
R
M
L

Figure 125. The ICx identiFINDER 2 with the KCl box for ^{40}K calibration.

As ^{40}K radiation interferes with that of other naturally occurring materials, ^{137}Cs is the better choice for a reliable calibration.

Please refer to the nuclide library (B, p. 239) for further information about the nuclides.

SETTINGS AND COMMANDS

Down, **Select**
Choose and select menu items, see 2.2.1, p. 20 for details.

+, **-**, **Accept**,
Change values, see 2.2.3, p. 23 for details.

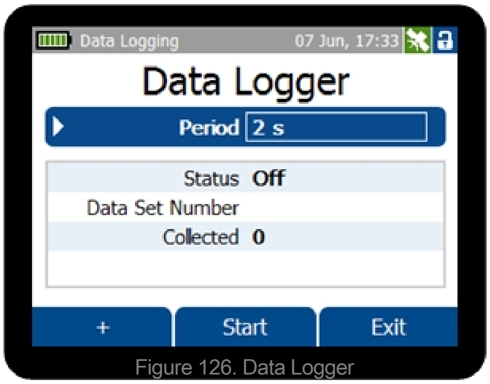
Exit
Return to the superior menu with

4.29 DATA LOGGER

Options Menu (p. 69) ➢ More Options (p. 69) ➢ Advanced Options (p. 70) ➢ Data Logging (p. 70) ➢ Data Logger

The ICx identiFINDER 2 can log measured dose rate values periodically. If your model is equipped with a neutron detector, the neutron counts are logged as well.

Location data (GPS) are not logged.



Data Logging 07 Jun, 17:33

Data Logger

Period 2 s

Status Off
Data Set Number
Collected 0

Figure 126. Data Logger

The values are recorded during a period you specify and the start time, end time, minimum, average, and maximum values for each period are saved.

Logged data are saved in sets of up to 1000 periods.

You can view the logged data (see 4.30, p. 115) or, more conveniently, from a computer connected to your ICx identiFINDER 2 (see 5, p. 145).

Refer to 4.25, p. 109 if you want to delete logged data.

SETTINGS AND COMMANDS

Period

Choose one of the available time periods for data logging:

2 sec, 5 sec, 10 sec, 20 sec, 30 sec, 1 min, 2 min, 5 min, 10 min, 20 min, 30 min.

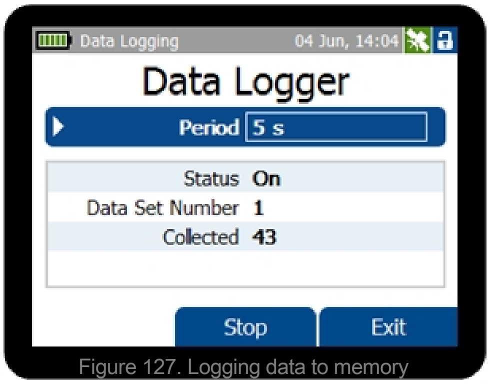
You cannot change the period while the data logger is running.

Status

The status (On or Off) of the data logger.

Data Set Number

The number you need to refer to this log for viewing (Figure 127, p. 114). If the logged data require more than one set for saving, the number of the first and last set are given here (Figure 128, p. 115).



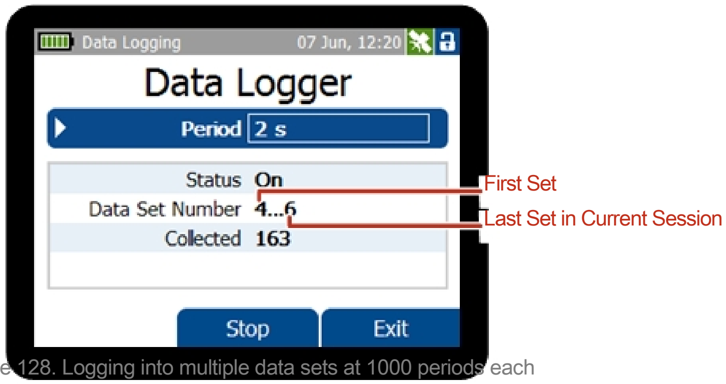
Period 5 s

Status On

Data Set Number 1

Collected 43

Figure 127. Logging data to memory



Data Logging 07 Jun, 12:20

Data Logger

Period 2 s

Status On
Data Set Number 4...6
Collected 163

Stop Exit

Figure 128. Logging into multiple data sets at 1000 periods each

Collected

The number of periods saved since you started the data logger.

+

Choose the next period from the list above with L.

Available only while the logger is not running.

Start ⇌ Stop

Start the data logger with M. Data logging stops when you switch off the ICx identiFINDER 2 or when you stop it by pressing M again.

If there is not enough free memory to log data, you will be informed. You can delete saved logs (see 4.25, p. 109) if necessary.

Exit

Return to the superior menu with R.

4.30 VIEW LOGGED DATA

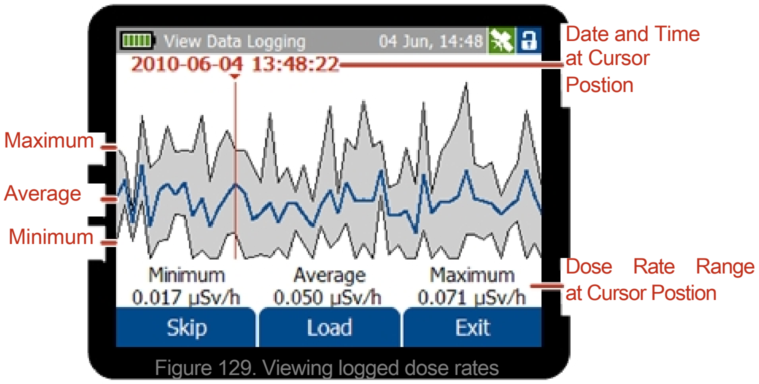
Options Menu (p. 69) ➢ More Options (p. 69) ➢ Advanced Options (p. 70) ➢ Data Logging (p. 70) ➢ View Logged Data

Data (p. 165) ➢ Data Logging (p. 187)

The ICx identiFINDER 2 can log continuously measured dose rate values periodically to permanent memory (see 4.29, p. 113).

You can load logged data for inspection on the display (Figure 129, p. 116). The logged data are plotted with the minimum, average, and maximum dose rate per logged period versus time. The scaling is adjusted to make best use of the available screen space.

The Load command (see below) will be executed immediately after entering this screen so you can select a data set for viewing.


View Data Logging 04 Jun, 14:48

2010-06-04 13:48:22

Minimum 0.017 µSv/h

Average 0.050 µSv/h

Maximum 0.071 µSv/h

Skip
Load
Exit
Date and Time at Cursor Postion
Maximum
Average
Minimum
Dose Rate Range at Cursor Postion

Figure 129. Viewing logged dose rates

SETTINGS AND COMMANDS

Skip

Cycle the list of commands with (see 2.2.2, p. 22).

Load

Load a set of logged data with .

You can choose from all the saved logs. While you step through the list, the start time and date of the log is displayed (Figure 130, p. 117) to help you choose the desired one.

If you don't want to load a set of logged data, press

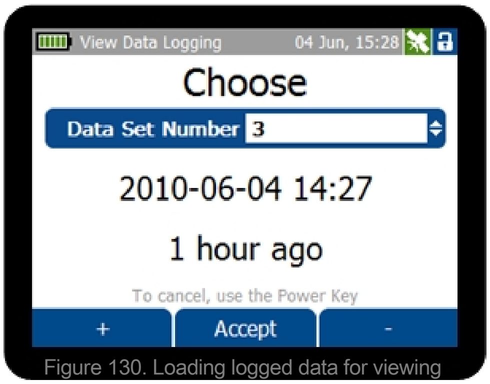
Loading large data sets can take a while.

Exit

Return to the superior menu with

Cursor Left

Move the cursor to the left with M . If you pass the left edge, the cursor wraps around to the right edge.



View Data Logging 04 Jun, 15:28

Choose

Data Set Number 3

2010-06-04 14:27

1 hour ago

To cancel, use the Power Key

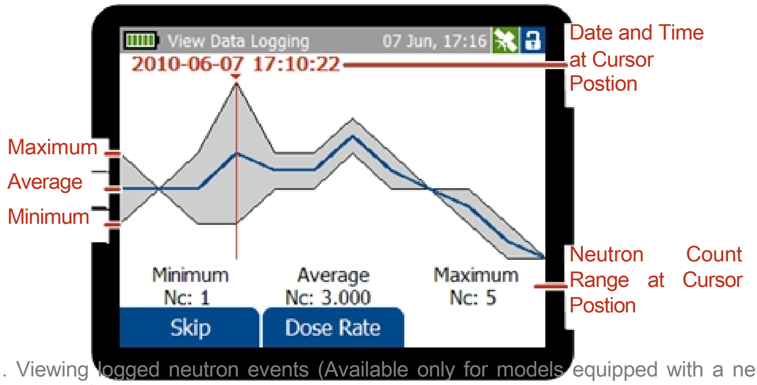
Figure 130. Loading logged data for viewing

Cursor Right

Move the cursor to the right with . If you pass the right edge, the cursor wraps around to the left edge.

Neutrons ⇌ **Dose Rate**

Toggle between viewing the dose rate (Figure 129, p. 116) and the neutron (Figure 131, p. 117) data of logged data with . (Available only for models equipped with a neutron detector.)



View Data Logging 07 Jun, 17:16

2010-06-07 17:10:22

Minimum Nc: 1

Average Nc: 3.000

Maximum Nc: 5

Skip
Dose Rate
Date and Time at Cursor Postion
Maximum
Average
Minimum
Neutron Count Range at Cursor Postion

Figure 131. Viewing logged neutron events (Available only for models equipped with a neutron detector.)

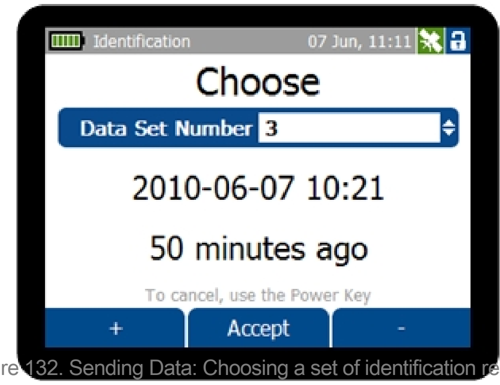
4.31 SEND IDENTIFICATION

Options Menu (p. 69) ➢ More Options (p. 69) ➢ Advanced Options (p. 70) ➢ Connectivity Options (p. 70) ➢ Send Data (p. 70) ➢ Send Identification

This command initiates a multi-step procedure to send a set of identification results stored in the ICx identiFINDER 2's database to a remote server (see 7, p. 197).

The procedure to send identification results is the same as that for sending spectra. The only difference is in the contents of the file sent. This description applies to both this and the Send Spectrum command (see 4.32, p. 121).

You can choose from the identification results available in the database (Figure 132, p. 118). The date and time of saving the identification is displayed while you step through the available data sets.



Choose

Data Set Number 3

2010-06-07 10:21

50 minutes ago

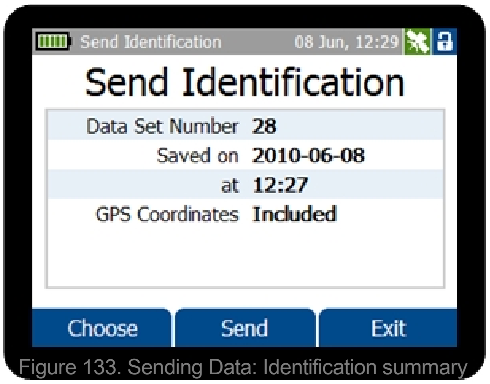
To cancel, use the Power Key

Figure 132. Sending Data: Choosing a set of identification results

If you entered this command from the Identification Mode (see 4.3, p. 60) or the spectrum display (see 4.7, p. 75), the correct data set is already chosen.

A summary of the chosen identification is shown (Figure 133, p. 119) so you can verify your choice and choose another data set if necessary.

The spectrum analyzed to compute the identification results is always included with the sent data.



Send Identification 08 Jun, 12:29

Send Identification

Data Set Number	28
Saved on	2010-06-08
at	12:27
GPS Coordinates	Included

Figure 133. Sending Data: Identification summary

SETTINGS AND COMMANDS

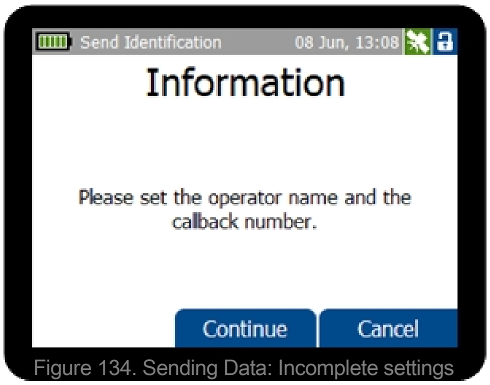
Choose

Choose another data set for sending with (Figure 132, p. 118).

Send

Start sending the chosen data set with M.

⚠ Several settings (see 7, p. 197) are required to send data. If any one of these settings is missing, you will be notified (Figure 134, p. 119) and routed to the appropriate screen to enter the missing setting.



Send Identification 08 Jun, 13:08

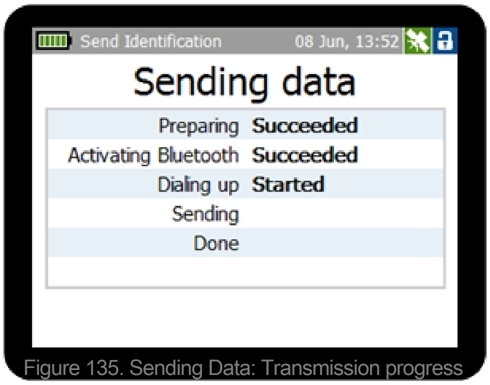
Information

Please set the operator name and the callback number.

Figure 134. Sending Data: Incomplete settings

We recommend specifying the required settings before sending data (see 4.34, p. 126 and 4.37, p. 131). The most convenient way to do so is via the web interface (see 6.8.1, p. 174).

During the transfer of data you will be kept posted about the progress of the transmission steps (Figure 135, p. 120).

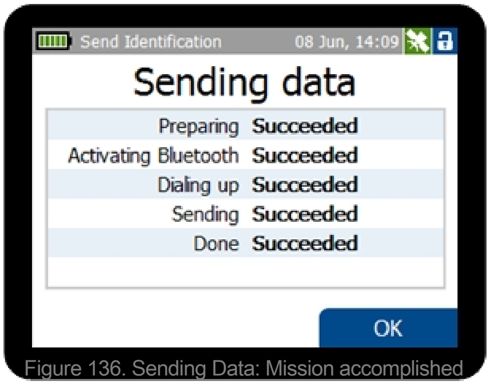

Send Identification 08 Jun, 13:52

Sending data

Preparing	Succeeded
Activating Bluetooth	Succeeded
Dialing up	Started
Sending	
Done	

Figure 135. Sending Data: Transmission progress

After all data are successfully transferred, you will be notified (Figure 136, p. 120) and can acknowledge the message with O mapped to R


Send Identification 08 Jun, 14:09

Sending data

Preparing	Succeeded
Activating Bluetooth	Succeeded
Dialing up	Succeeded
Sending	Succeeded
Done	Succeeded

Figure 136. Sending Data: Mission accomplished

+, -, Accept, ⏻

Change values, see 2.2.3, p. 23 for details.

Exit

Return to the superior menu with

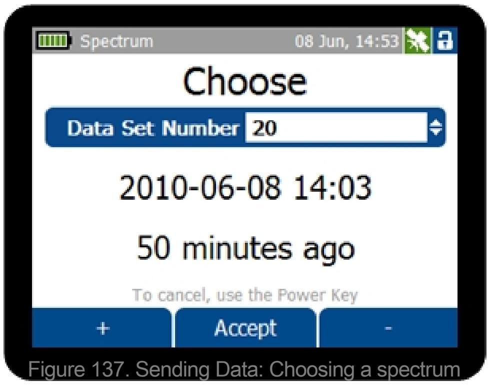
4.32 SEND SPECTRUM

Options Menu (p. 69) ➢ More Options (p. 69) ➢ Advanced Options (p. 70) ➢ Connectivity Options (p. 70) ➢ Send Data (p. 70) ➢ Send Spectrum

This command initiates a multi-step procedure to send a spectrum stored in the ICx identiFINDER 2's database to a remote server (see 7, p. 197).

The procedure to send spectra is the same as that for sending identification results. The description of the procedure is not repeated here, please refer to the previous section 4.31, p. 118.

The only difference is in the contents of the file sent. You can choose from the spectra available in the database (Figure 137, p. 121). The date and time of saving the spectrum is displayed while you step through the available data sets.



Choose

Data Set Number 20

2010-06-08 14:03

50 minutes ago

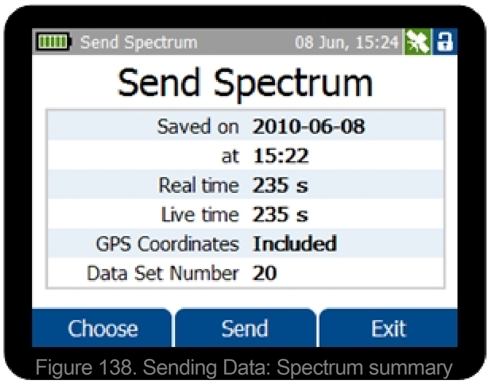
To cancel, use the Power Key

Figure 137. Sending Data: Choosing a spectrum

If you entered this command from the spectrum display (see 4.7, p. 75), the correct spectrum is already chosen.

A summary of the chosen spectrum is shown (Figure 138, p. 122) so you can verify your choice and choose another spectrum if necessary.

Please refer to section 4.31, p. 118 for a description of the remaining steps to send a spectrum.



Send Spectrum 08 Jun, 15:24

Send Spectrum

Saved on	2010-06-08
at	15:22
Real time	235 s
Live time	235 s
GPS Coordinates	Included
Data Set Number	20

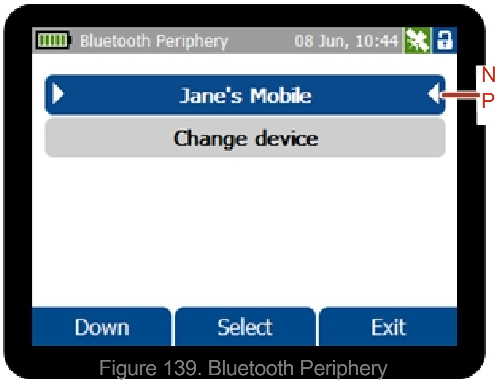
Choose
Send
Exit

Figure 138. Sending Data: Spectrum summary

4.33 BLUETOOTH PERIPHERY

Options Menu (p. 69) ➢ More Options (p. 69) ➢ Advanced Options (p. 70) ➢ Connectivity Options (p. 70) ➢ Bluetooth Periphery

This command (Figure 139, p. 122) shows the Bluetooth device your ICx identiFINDER 2 is currently paired with, if any, and lets you search the vicinity for other suitable Bluetooth devices supporting dial-up networking (7, p. 197).



Bluetooth Periphery 08 Jun, 10:44
Jane's Mobile
Change device
Down
Select
Exit

Name of the Currently Paired Bluetooth Device

Figure 139. Bluetooth Periphery

If your ICx identiFINDER 2 is not currently paired with any Bluetooth device, the Change Device command is executed immediately.

Bluetooth Device Name

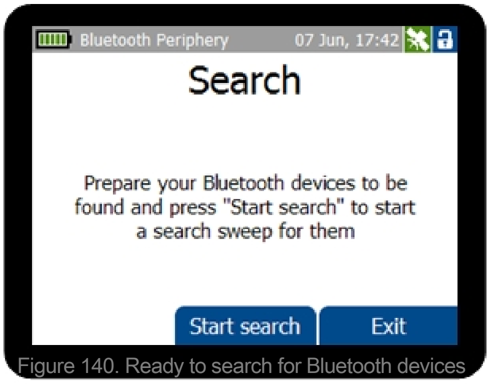
The name of the device the ICx identiFINDER 2 is currently paired with. Selecting this item shows details about this device (Figure 145, p. 125).

Change Device

Guides you through the steps necessary to pair your ICx identiFINDER 2 with a Bluetooth device.

➔ To pair with a Bluetooth device. . .

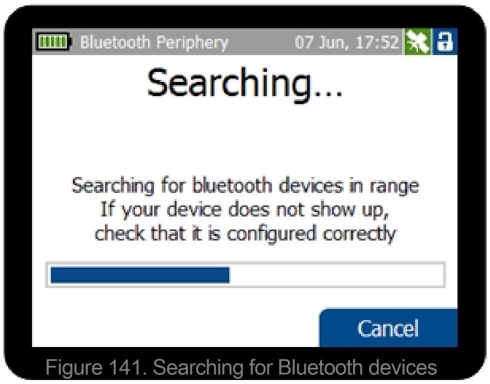
1. Prepare the Bluetooth device and make sure it can be found (perhaps called " discoverable" or " visible" in the device's settings).
2. Place the device in the vicinity of the ICx identiFINDER 2 (up to ca. 10 m (33 ft)).
3. Initiate a search for devices with Start Search mapped to M (Figure 140, p. 123).



Prepare your Bluetooth devices to be found and press "Start search" to start a search sweep for them

Figure 140. Ready to search for Bluetooth devices

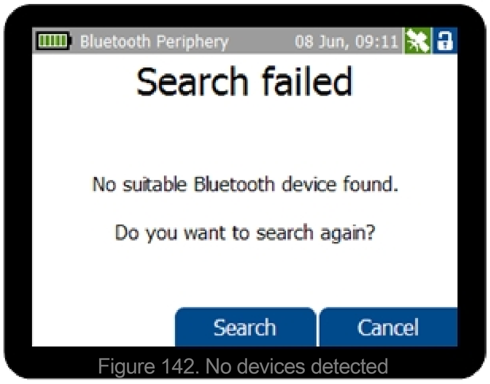
4. Wait a few moments while the ICx identiFINDER 2 searches for Bluetooth devices supporting the required protocol (Figure 141, p. 124).
5. You can repeat the search if no device was found (Figure 142, p. 124) with Search
6. Choose the desired Bluetooth device from the list shown (Figure 143, p. 125) with Down mapped to .



Searching...

Searching for bluetooth devices in range
If your device does not show up,
check that it is configured correctly

Figure 141. Searching for Bluetooth devices



Search failed

No suitable Bluetooth device found.

Do you want to search again?

Figure 142. No devices detected

The device names are listed exactly as received from the detected devices. In case of ambiguous names, you should change the name of the Bluetooth device to something unique (refer to the manuals of your Bluetooth devices on how to achieve that).

If your desired device is not shown in the list, make sure its setup is correct, press Exit, select the command Bluetooth Periphery again and start another search.

7. To start the pairing with the chosen device, press Select. To establish a trusted connection, your device might require additional steps like entering a PIN. Use the PIN shown on your ICx identiFINDER 2 screen (Figure 144, p. 125).

For questions refer to the manual that came with your Bluetooth device.

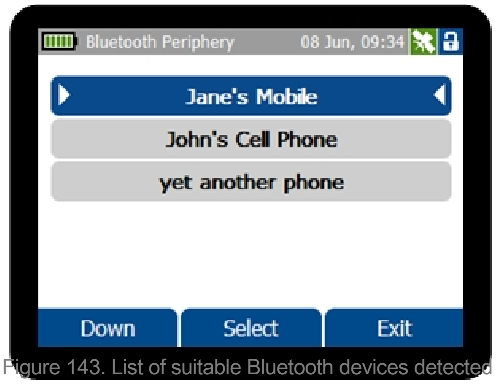
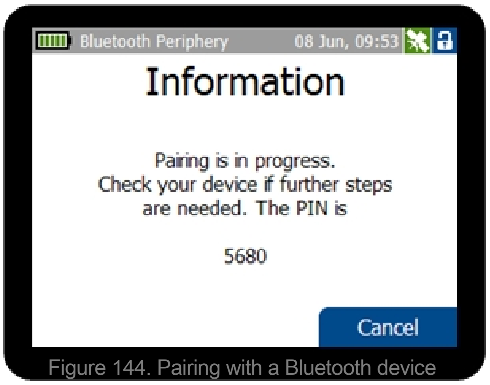

Bluetooth Periphery
08 Jun, 09:34
Jane's Mobile
John's Cell Phone
yet another phone
Down
Select
Exit

Figure 143. List of suitable Bluetooth devices detected


Bluetooth Periphery
08 Jun, 09:53
Cancel

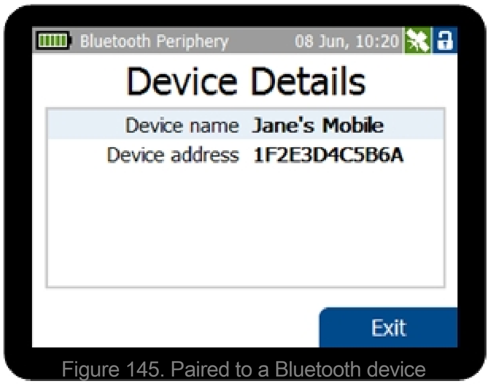
Information

Pairing is in progress.
Check your device if further steps
are needed. The PIN is

5680

Figure 144. Pairing with a Bluetooth device

8. The ICx identiFINDER 2 shows some information about the Bluetooth device after a successful pairing (Figure 145, p. 125).

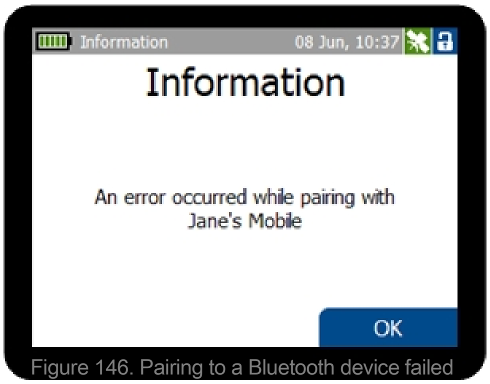

Bluetooth Periphery
08 Jun, 10:20
Exit

Device Details

Device name Jane's Mobile
Device address 1F2E3D4C5B6A

Figure 145. Paired to a Bluetooth device

An error message (Figure 146, p. 126) is displayed if pairing failed. Make sure the Bluetooth device is correctly configured, still in the vicinity, and try again.



Information

An error occurred while pairing with Jane's Mobile

Figure 146. Pairing to a Bluetooth device failed

Your ICx identiFINDER 2 is now ready to communicate via the Bluetooth device.

Make sure not to move the Bluetooth device more than about 10 m (33 ft) away from the ICx identiFINDER 2.

Down, Select

Choose and select menu items, see 2.2.1, p. 20 for details.

+, -, Accept,

Change values, see 2.2.3, p. 23 for details.

Exit

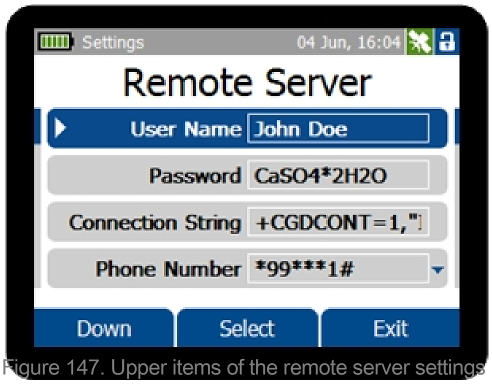
Return to the superior menu with

4.34 REMOTE SERVER SETTINGS

Options Menu (p. 69) ➢ More Options (p. 69) ➢ Advanced Options (p. 70) ➢ Connectivity Options (p. 70) ➢ Remote Server Settings

Settings (p. 164) ➢ Connectivity (p. 173) ➢ Remote Server (p. 174)

This screen (Figure 147, p. 127) groups settings that influence the transfer of ICx identiFINDER 2 data to a remote server. Refer to Chapter 7, p. 197 for details of this method.



Remote Server

User Name John Doe
Password CaSO4*2H2O
Connection String +CGDCONT=1,"
Phone Number *99***1#

Figure 147. Upper items of the remote server settings

SETTINGS AND COMMANDS

User Name

The user name and

Password

the password as provided by your cell phone carrier.

Connection String

The connection info as provided by your cell phone carrier.

Phone Number

The phone number to access a data connection as provided by your cell phone carrier or cell phone vendor.

HTTP URI

The address of the server receiving data from the ICx identiFINDER 2.

Down, **Select**

Choose and select menu items, see 2.2.1, p. 20 for details.

+, **-**, **Accept**, ⏻

Change values, see 2.2.3, p. 23 for details.

Left, **Right**, **Insert**, **Delete**

Edit composite and text values, see 2.2.4, p. 25 and 2.2.5, p. 26 for details.

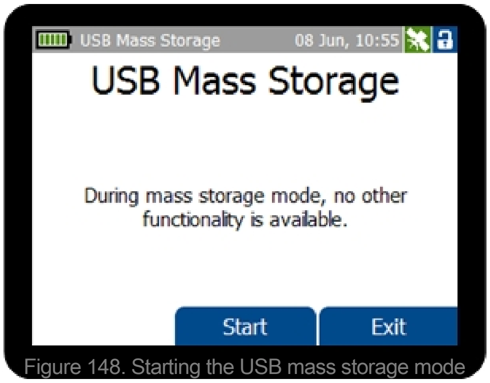
Exit

Return to the superior menu with R

4.35 MASS STORAGE

Options Menu (p. 69) ➢ More Options (p. 69) ➢ Advanced Options (p. 70) ➢ Connectivity Options (p. 70) ➢ Mass Storage

This command (Figure 148, p. 128) lets the ICx identiFINDER 2 behave like a USB mass storage device similar to hard disk or a USB stick. You can connect it to a local computer (5.2, p. 148) to copy files from the ICx identiFINDER 2 to the computer.


USB Mass Storage 08 Jun, 10:55

USB Mass Storage

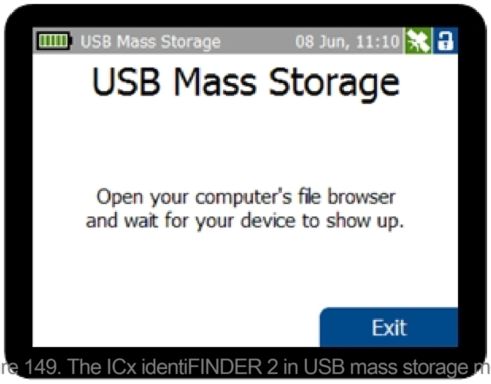
During mass storage mode, no other functionality is available.

Figure 148. Starting the USB mass storage mode

SETTINGS AND COMMANDS

Start

Start the USB mass storage mode (Figure 149, p. 128) with M .


USB Mass Storage 08 Jun, 11:10

USB Mass Storage

Open your computer's file browser and wait for your device to show up.

Figure 149. The ICx identiFINDER 2 in USB mass storage mode

All of the ICx identiFINDER 2 network services will stop and after a few moments the ICx identiFINDER 2 will be recognized as an external hard disk by the connected computer. Use the file browser of your computer to inspect, for example, the drivers and screenshot files on the ICx identiFINDER 2.

While the ICx identiFINDER 2 acts as a hard drive, you cannot operate it. Routine jobs like the data logger or monitoring the radiation for exceeding the alarm thresholds are not interrupted.

Any change you make to the ICx identiFINDER 2 hard drive will be discarded immediately upon terminating the connection.

Exit

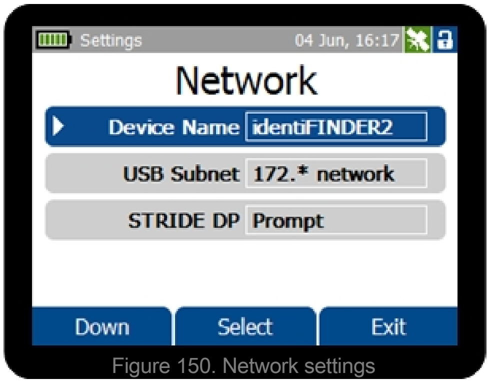
Return to the superior menu with . The ICx identiFINDER 2's network services will be reactivated.

4.36 NETWORK

Options Menu (p. 69) ➢ More Options (p. 69) ➢ Advanced Options (p. 70) ➢ Connectivity Options (p. 70) ➢ Network

Settings (p. 164) ➢ Connectivity (p. 173) ➢ Local Area Network (p. 174)

This screen (Figure 150, p. 129) groups settings related to the connections between your ICx identiFINDER 2 and a computer.



Device Name: identiFINDER2

USB Subnet: 172.* network

STRIDE DP: Prompt

Figure 150. Network settings

SETTINGS AND COMMANDS

Device Name

The name of this ICx identiFINDER 2 to identify it in communication with other devices.

Spaces are not allowed in this text.

USB Subnet

To connect to the ICx identiFINDER 2 via IP, it must have an IP address. This address is taken from one of the pools of IP addresses reserved by the IANA for private networks. You can choose from the listed pools.

Try to avoid subnets already in use in your local area network. Ask your network administrator when in doubt which pool best suits your network environment.

172.* Network

1048576 addresses from 172.16.0.0 to 172.31.255.255

10.* Network

16777216 addresses from 10.0.0.0 to 10.255.255.255

192.168.* Network

65536 addresses from 192.168.0.0 to 192.168.255.255

You can choose the subnet but not the IP address. The address is fixed and remains always the same for a given instrument.

The current IP address is shown on-screen whenever the ICx identiFINDER 2 detects a connection to a network. (Figure 151, p. 131)

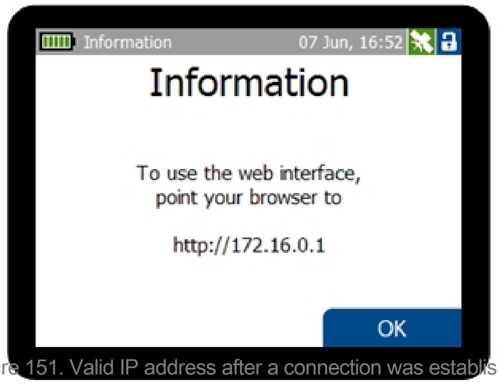
STRIDE DP

The ICx identiFINDER 2 can be used as a Detection Unit in a STRIDE environment. Specify how the ICx identiFINDER 2 should handle a connection request by, for example, a STRIDE Server.

Please refer to the STRIDE Software manual for details about the STRIDE protocol.

Prompt

When a STRIDE Server requests to establish a connection, you will be prompted to allow or deny the connection.



Information

To use the web interface, point your browser to

http://172.16.0.1

Figure 151. Valid IP address after a connection was established

Deny

A request from a STRIDE Server will always be denied.

Allow

A request from a STRIDE Server will always be allowed.

Down, Select

Choose and select menu items, see 2.2.1, p. 20 for details.

+, -, Accept,

Change values, see 2.2.3, p. 23 for details.

Exit

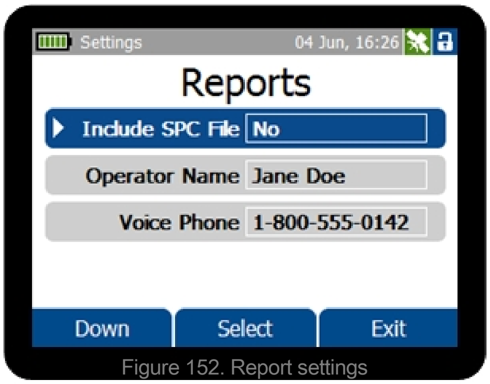
Return to the superior menu with

4.37 REPORT SETTINGS

Options Menu (p. 69) ➢ More Options (p. 69) ➢ Advanced Options (p. 70) ➢ Connectivity Options (p. 70) ➢ Report Settings

Settings (p. 164) ➢ Connectivity (p. 173) ➢ Reports (p. 174)

This screen (Figure 152, p. 132) groups settings specifying the content of reports you can download via the ICx identiFINDER 2's web interface (6, p. 159) or send to remote servers (7, p. 197).



Reports

Include SPC File	No
Operator Name	Jane Doe
Voice Phone	1-800-555-0142

Figure 152. Report settings

SETTINGS AND COMMANDS

Include SPC File

Specify whether an old-style *.spc spectrum file should be included in addition to the standardized *.n42 file when transferring reports to a computer.

Operator Name

Your name and. . .

Voice Phone

your phone number for inclusion in reports.

Down, **Select**

Choose and select menu items, see 2.2.1, p. 20 for details.

+, **-**, **Accept**,

Change values, see 2.2.3, p. 23 for details.

Left, **Right**, **Insert**, **Delete**

Edit composite and text values, see 2.2.4, p. 25 and 2.2.5, p. 26 for details.

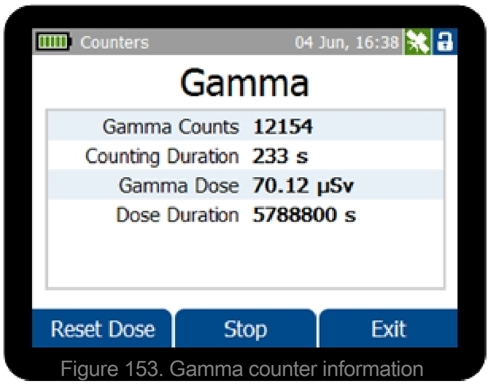
Exit

Return to the superior menu with

4.38 GAMMA, NEUTRON COUNTERS

Options Menu (p. 69) ➢ Gamma, Neutron Counters

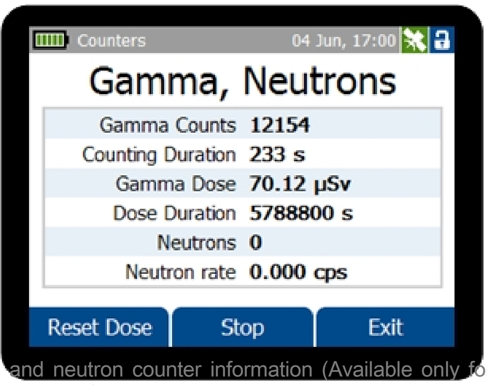
This command displays the state of various counters (Figure 153, p. 133). If your model is equipped with a neutron detector, its results will be shown as well (Figure 154, p. 133).



Gamma

Gamma Counts	12154
Counting Duration	233 s
Gamma Dose	70.12 µSv
Dose Duration	5788800 s

Figure 153. Gamma counter information



Gamma, Neutrons

Gamma Counts	12154
Counting Duration	233 s
Gamma Dose	70.12 µSv
Dose Duration	5788800 s
Neutrons	0
Neutron rate	0.000 cps

Figure 154. Gamma and neutron counter information (Available only for models equipped with a neutron detector.)

The counters for gamma and neutrons (if available) are reset when you switch on the ICx identiFINDER 2 or when you reset them explicitly (see below).

The counter for dose keeps accumulating data until you explicitly reset it (see below).

SETTINGS AND COMMANDS

Gamma Counts

The accumulated gamma counts.

Counting Duration

The time frame, in seconds, in which the neutrons shown at the bottom and gamma counts shown above were measured.

Gamma Dose

The accumulated gamma dose. You can specify the unit used for display, see 4.40, p. 137.

Dose Duration

The time span, in seconds, in which the gamma dose shown above was measured.

Neutrons

The accumulated neutron counts. (Available only for models equipped with a neutron detector.)

Neutron Rate

The current neutron rate in counts per second (Available only for models equipped with a neutron detector.).

Reset Dose

Reset both the Gamma Dose and Dose Duration with . Measuring is not interrupted, merely the accumulated values are set to zero.

Stop ⇌ **Reset**

Stop the accumulation of data for neutrons (if available) and gamma with M.

To reset the accumulators and timers for neutrons (if available) and gamma counts to zero and resume accumulating new data, press again.

Exit

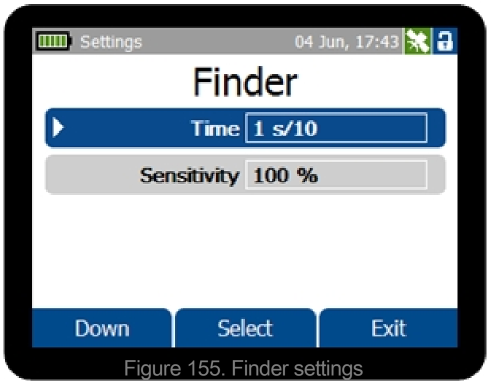
Return to the superior menu with R

4.39 FINDER SETTINGS

Options Menu (p. 69) ➢ Finder Settings

Settings (p. 164) ➢ General (p. 168) ➢ Measurement (p. 169)

This screen (Figure 155, p. 135) groups options that influence the ICx identiFINDER 2's behavior in Finder mode (see 4.2, p. 57).



Time 1 s/10

Sensitivity 100 %

Figure 155. Finder settings

SETTINGS AND COMMANDS

Time

Specify the time represented by one column in the history chart of the Finder mode (see 4.2, p. 57). You can specify values from $\frac{1}{10}$ to $\frac{}{10}$ seconds, that is, from 0.1 to 5 seconds.

The ICx identiFINDER 2 averages the count rate for the time you specify and adds a column to the chart representing the result at the end of each period.

The smaller the value, the more lively the display; the larger the value, the better the chance to find weaker sources.

Sensitivity

Specify the sensitivity for audible feedback in Finder mode (see 4.2, p. 57). You can specify values from 50 to 200 %.

While in Finder mode, the ICx identiFINDER 2 emits sound when the count rate rises above a threshold C_S which is represented by the dashed line across the top of the Finder display (Figure 69, p. 58).

The threshold is related to the average background count rate $\langle BCR\rangle$ (measured when you enter the Finder mode), its variation $\sigma_p = \overline{\langle BCR\rangle}$, and the sensitivity you specify here according to

$$C_S = \langle BCR\rangle + 3.5 * \sigma * \frac{100}{\text{Sensitivity [\%]}}$$

This equation is solved for some common values of the background variation σ in Table 2, p. 136. Look up the sensitivity value next to the desired σ and enter it.

Table 2. Finder Mode: Background variation vs. sensitivity

σ	Sensitivity [%]
7	50
6.5	54
6	58
5.5	64
5	70
4.5	78
4	88
3.5	100
3	117
2.5	140
2	175
1.75	200

Down, **Select**

Choose and select menu items, see 2.2.1, p. 20 for details.

+, **-**, **Accept**, ⏻

Change values, see 2.2.3, p. 23 for details.

Exit

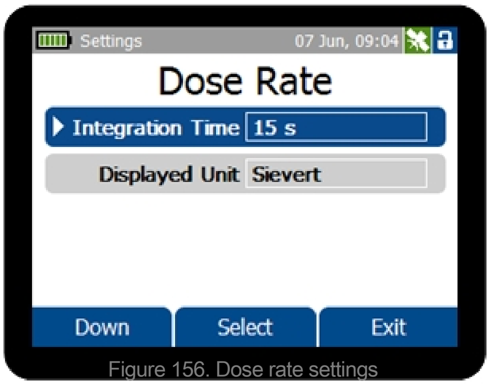
Return to the superior menu with

4.40 DOSE RATE SETTINGS

Options Menu (p. 69) ➢ Dose Rate Settings

Settings (p. 164) ➢ General (p. 168) ➢ Measurement (p. 169)

This screen (Figure 156, p. 137) groups options that influence the display of dose and dose rate values (see 4.1, p. 54).



Dose Rate

Integration Time 15 s

Displayed Unit Sievert

Figure 156. Dose rate settings

SETTINGS AND COMMANDS

Integration Time

The ICx identiFINDER 2 calculates a moving average to reduce fluctuation in the dose rate display. Choose the interval for the averaging in seconds.

You can specify values between 1 and 50 seconds, the longer the duration the less fluctuation is displayed. The recommended value is 15 s.

If dose rates go up to high values fast, the ICx identiFINDER 2 drops the averaging to alert you quickly.

Displayed Unit

Choose the unit for the display of dose rates.

This setting influences all displays of dose and dose rate values, for example the display of dose alarm thresholds (see 4.42, p. 139).

Sievert

Sievert is a derived unit according to the International System of Units and the legally prescribed unit in many jurisdictions.

rem Röntgen equivalent in man per hour. rem is an outdated unit and no longer allowed in many jurisdictions.

1 Sv = 100 rem.

Down, Select

Choose and select menu items, see 2.2.1, p. 20 for details.

+, -, Accept,

Change values, see 2.2.3, p. 23 for details.

Exit

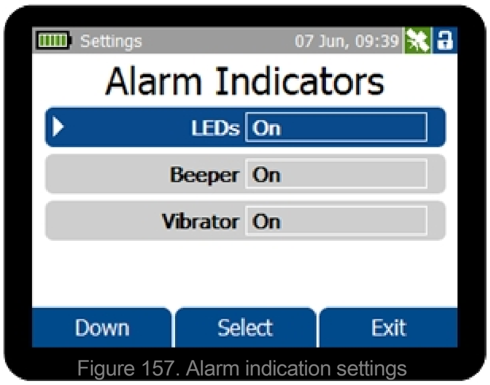
Return to the superior menu with

4.41 ALARM INDICATORS

Options Menu (p. 69) ➢ Alarm Options (p. 71) ➢ Alarm Indicators

Settings (p. 164) ➢ Alarm (p. 171) ➢ Alarm Indicators (p. 171)

The ICx identiFINDER 2 reports various events with on-screen messages. Additionally, you can have it report events, especially alarms, with other methods (Figure 157, p. 138). You can switch each of the annunciation methods independently.



LEDs On

Beeper On

Vibrator On

Figure 157. Alarm indication settings

The signals used to report alarms are detailed in chapter 4.4, p. 64.

SETTINGS AND COMMANDS

LEDs

Switch front-side LEDs on or off.

This setting does not affect the power indicator LEDs on the ICx identiFINDER 2’s back side. They cannot be switched off.

Beeper

Switch the beeper on or off.

Vibrator

Switch the vibrator on or off.

Down, **Select**

Choose and select menu items, see 2.2.1, p. 20 for details.

+, **-**, **Accept**,

Change values, see 2.2.3, p. 23 for details.

Exit

Return to the superior menu with

4.42 DOSE ALARM THRESHOLDS

Options Menu (p. 69) ➢ Alarm Options (p. 71) ➢ Dose Alarm Thresholds

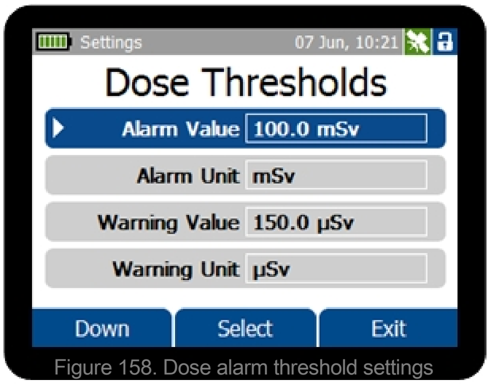
Settings (p. 164) ➢ Alarm (p. 171) ➢ Gamma Alarms (p. 171)

This screen (Figure 158, p. 140) groups the thresholds for dose warnings and alarms.

Specify thresholds for warnings and alarms by setting a value and a unit independently. The base unit (Sv or rem) available here reflects your preferences (see 4.40, p. 137).

You can specify values between 1 nSv and 1 Sv (1 nrem to 100 rem).

For meaningful alerts, specify an alarm threshold above the warning threshold.



Dose Thresholds

Alarm Value 100.0 mSv

Alarm Unit mSv

Warning Value 150.0 µSv

Warning Unit µSv

Figure 158. Dose alarm threshold settings

SETTINGS AND COMMANDS

Alarm Value

The value for the alarm threshold. Use " Off" (the lowest value) to suppress this alarm.

Alarm Unit

The unit of the value above:

nSv - µSv - mSv - Sv (nrem - µrem - mrem - rem)

Warning Value

The value for the warning threshold. Use " Off" (the lowest value) to suppress this warning.

Warning Unit

The unit of the value above:

nSv - µSv - mSv - Sv (nrem - µrem - mrem - rem)

Down, **Select**

Choose and select menu items, see 2.2.1, p. 20 for details.

+, **-**, **Accept**,

Change values, see 2.2.3, p. 23 for details.

Exit

Return to the superior menu with

4.43 DOSE RATE ALARM THRESHOLDS

Options Menu (p. 69) ➢ Alarm Options (p. 71) ➢ Dose Rate Alarm Thresholds

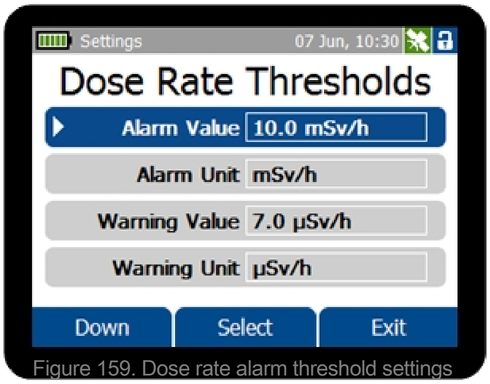
Settings (p. 164) ➢ Alarm (p. 171) ➢ Gamma Alarms (p. 171)

This screen (Figure 159, p. 141) groups the thresholds for dose rate warnings and alarms.

Specify thresholds for warnings and alarms by setting a value and a unit independently. The base unit (Sv/h or rem/h) available here reflects your preferences (see 4.40, p. 137).

You can specify values between 1 nSv/h and 1 Sv/h (1 nrem/h to 100 rem/h).

For meaningful alerts, specify an alarm threshold above the warning threshold.



Dose Rate Thresholds

Alarm Value 10.0 mSv/h

Alarm Unit mSv/h

Warning Value 7.0 µSv/h

Warning Unit µSv/h

Figure 159. Dose rate alarm threshold settings

SETTINGS AND COMMANDS

Alarm Value

The value for the alarm threshold. Use “Off” (the lowest value) to suppress this alarm.

Alarm Unit

The unit of the value above:

nSv/h - µSv/h - mSv/h - Sv/h (nrem/h - µrem/h - mrem/h - rem/h)

Warning Value

The value for the warning threshold. Use “ Off” (the lowest value) to suppress this alarm.

Warning Unit

The unit of the value above:

nSv/h - µSv/h - mSv/h - Sv/h (nrem/h - µrem/h - mrem/h - rem/h)

Down, **Select**

Choose and select menu items, see 2.2.1, p. 20 for details.

+, **-**, **Accept**, ⏻

Change values, see 2.2.3, p. 23 for details.

Exit

Return to the superior menu with R

4.44 NEUTRON ALARM THRESHOLDS

Options Menu (p. 69) ➢ Alarm Options (p. 71) ➢ Neutron Alarm Thresholds

Settings (p. 164) ➢ Alarm (p. 171) ➢ Neutron Alarms (p. 172)

This screen (Figure 160, p. 143) groups the thresholds for neutron warnings and alarms.

Available only for models equipped with a neutron detector.

Both the warning and alarm thresholds are given as a fraction of neutrons per duration. That is, every threshold is defined by a pair of settings (counts and time).

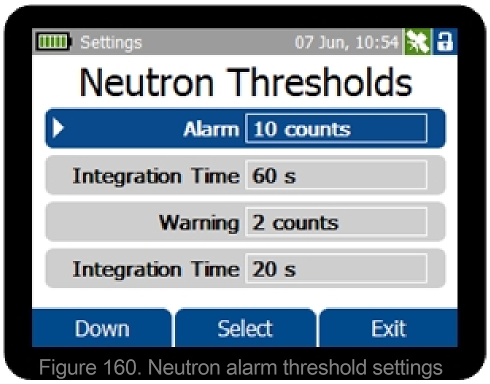
For meaningful alerts, specify an alarm threshold above the warning threshold.

SETTINGS AND COMMANDS

Alarm

The minimum number of neutrons in the period specified below to trigger an alarm.

You can specify values between 2 and 500.



Settings 07 Jun, 10:54

Neutron Thresholds

Alarm	10 counts
Integration Time	60 s
Warning	2 counts
Integration Time	20 s

Figure 160. Neutron alarm threshold settings

Integration Time

The duration in seconds for the number of neutrons specified above to be detected.

You can specify values between 5 and 60 seconds.

Warning

The minimum number of neutrons in the period specified below to trigger a warning.

You can specify values between 2 and 500.

Integration Time

The duration in seconds for the number of neutrons specified above to be detected.

You can specify values between 5 and 60 seconds.

Down, **Select**

Choose and select menu items, see 2.2.1, p. 20 for details.

+, **-**, **Accept**,

Change values, see 2.2.3, p. 23 for details.

Exit

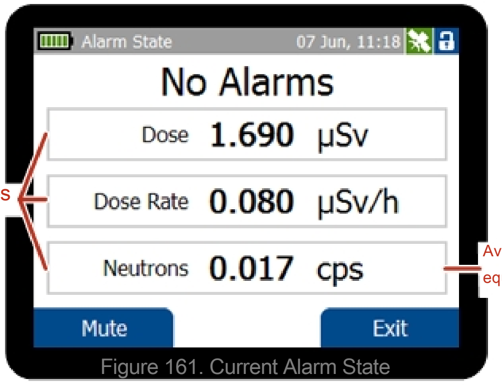
Return to the superior menu with

4.45 CURRENT ALARM STATE

Options Menu (p. 69) ➢ Alarm Options (p. 71) ➢ Current Alarm State

This screen (Figure 161, p. 144) is identical to the alarm screen always shown when a warning or an alarm is raised (compare 4.4, p. 64).

Current Values



Alarm State 07 Jun, 11:18

No Alarms

Dose	1.690	µSv
Dose Rate	0.080	µSv/h
Neutrons	0.017	cps

Available only for models equipped with a neutron detector.

Figure 161. Current Alarm State

SETTINGS AND COMMANDS

Mute

Switch off the beeper and vibrator for the current alarm, if any, with . The next alarm, if any, reactivates sound and vibration.

Acknowledge

Return to the superior menu with

5 Connecting the ICx identiFINDER 2 to a Local Computer

The ICx identiFINDER 2 can be connected to a computer via Universal Serial Bus (USB).

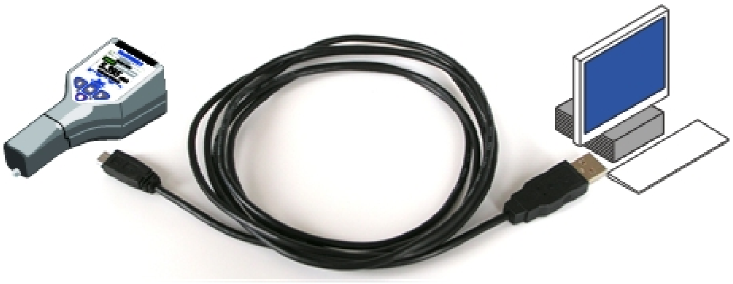


Figure 162. Connecting the ICx identiFINDER 2 (Micro USB-B connector) and a computer (USB-A connector)

The connection between the ICx identiFINDER 2 and the computer serves two purposes:

Energy Supply

> The computer provides external power for running the ICx identiFINDER 2 or charging the batteries. Refer to chapter 8, p. 201 for details.

Data Communication

> The ICx identiFINDER 2 supports several methods of data communication via USB which are explained in this and the following chapter.
>
> Mass Storage Device
>
> > The ICx identiFINDER 2 can behave as a mass storage device to transfer data to the computer.
> >
> > ⚠ This mode is exclusive, that is, no other data communication is possible while the ICx identiFINDER 2 behaves as a mass storage device.
>
> Web Server
>
> > The ICx identiFINDER 2 can act as a web server you can access

in a web browser to download data or to operate the ICx identiFINDER 2 and change its settings with the enhanced convenience of a large screen and a real keyboard.

The remainder of this chapter explains:

- How to set up the physical connection (5.1, p. 146)
- How to use the ICx identiFINDER 2 as a mass storage device (5.2, p. 148)
- How to prepare the computer (5.3, p. 148) for accessing the web interface detailed in chapter 6, p. 159.

5.1 PLUGGING AND UNPLUGGING

■ The ICx identiFINDER 2 draws a current of approximately 400 mA. Before connecting to a computer, please make sure the USB outlet of the computer complies with this requirement. This might not be the case with some laptops, netbooks or similar battery powered devices.

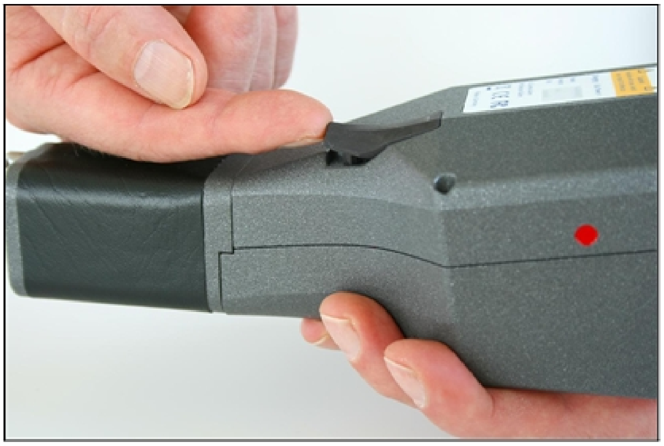


Figure 163. Removing the USB socket cover

Before you can plug a cable into the USB socket of the ICx identiFINDER 2, you have to remove the socket's cover (Figure 163, p. 146).

Use the Micro USB-B to USB-A cable supplied with the ICx identiFINDER 2 to establish the connection.

You can use any equivalent third-party cable provided the Micro USB-B plug is not too wide for the narrow notch in the ICx identiFINDER 2 housing.

Always grab the plug at the strain relief and slide it straight into or out of the receptacle (Figure 164, p. 147).

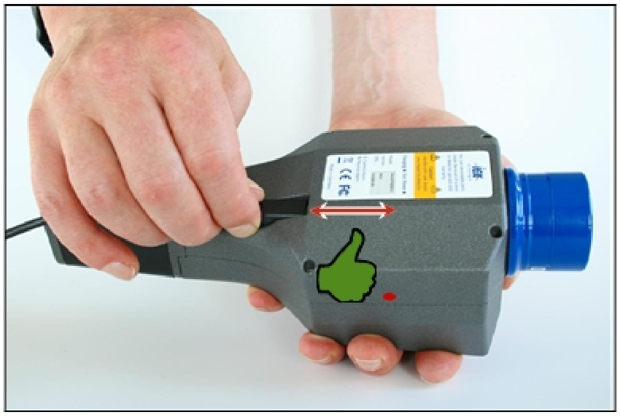


Figure 164. Plugging and unplugging the cable

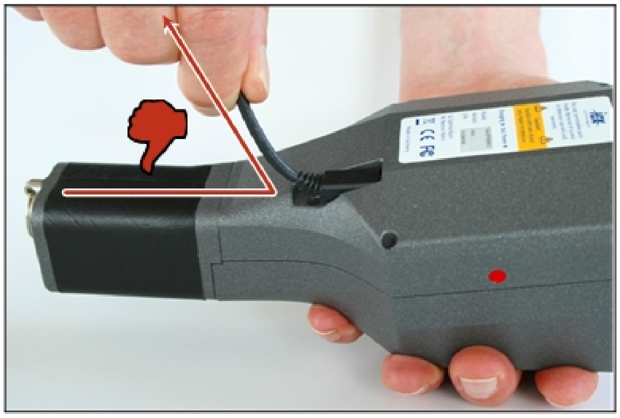


Figure 165. Do not bend the cable or the plug!

Do not pull at the cable behind the connector and do not bend it when removing it from the ICx identiFINDER 2 (Figure 165, p. 147).

5.2 THE ICx identiFINDER 2 AS A MASS STORAGE DEVICE

Computers supporting the connection of USB devices usually have a driver for devices identifying themselves as mass storage, for example USB sticks or USB hard disks. The ICx identiFINDER 2 supports the same standard.

You can use this mode of operation, for example, to copy screenshots taken on the ICx identiFINDER 2 to your computer or to install the drivers for the web interface access (5.3, p. 148).

➔ To mount the ICx identiFINDER 2 as USB mass storage. . .

1. Switch the ICx identiFINDER 2 to mass storage mode (see Mass Storage ,4.35, p. 128).
2. Connect the ICx identiFINDER 2 to the computer with the included cable.

   The mass storage device shows up on your computer after a few moments (Figure 166, p. 149).

➔ To unmount the ICx identiFINDER 2 as USB mass storage. . .

1. Follow the standard procedure for unmounting mass storage devices as recommended by your operating system. Please refer to the manual or help system that came with your operating system for details.
2. Unplug the connection cable.
3. Press Exit on the ICx identiFINDER 2 to return from USB mass storage mode to normal operation (see 4.35, p. 128).

5.3 PREPARING THE USB NETWORK CONNECTION ON A COMPUTER

Depending on the operating system of your computer, you might need to install additional software to access the web interface (see 6, p. 159) of the ICx identiFINDER 2.

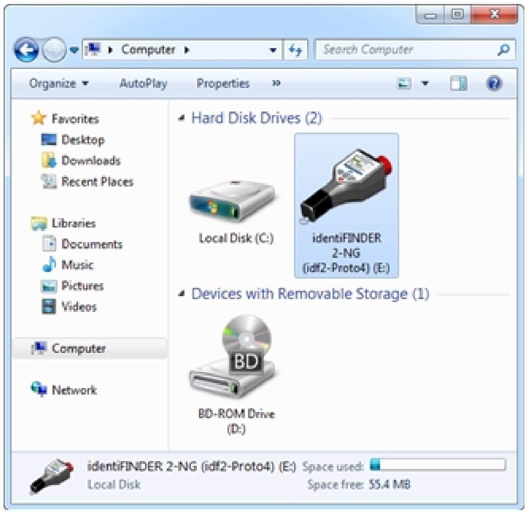

Computer
Search Computer
Organize
AutoPlay
Properties
Favorites
Desktop
Downloads
Recent Places
Libraries
Documents
Music
Pictures
Videos
Computer
Network
Hard Disk Drives (2)
Local Disk (C:)
identiFINDER 2-NG (idf2-Proto4) (E:)
Devices with Removable Storage (1)
BD
BD-ROM Drive (D:)
identiFINDER 2-NG (idf2-Proto4) (E:) Space used:
Local Disk
Space free: 55.4 MB

Figure 166. ICx identiFINDER 2 mounted as mass storage device on a computer running Microsoft Windows 7

5.3.1 LINUX

No special installation is required for recent Linux distributions. Fedora 13 and Ubuntu 10.4 were tested successfully. There should be a good chance with other modern distributions as well.

Just connect the ICx identiFINDER 2 to the computer with the included cable and you are ready to go.

5.3.2 WINDOWS XP

You must install the driver software included within the ICx identiFINDER 2 before you can use the USB network connection of the ICx identiFINDER 2.

⚠ This installation requires you to have administrator privileges for your computer. Ask your IT administrator if in doubt.

The driver installer is included with the ICx identiFINDER 2, you can access it via the USB mass storage mode (5.2, p. 148).

➔ To install the driver software. . .

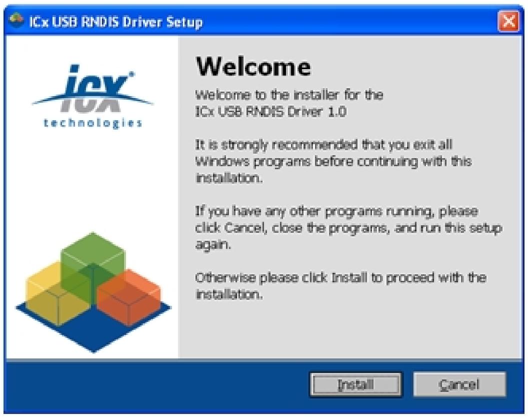
1. Start the mass storage connection from the ICx identiFINDER 2 to your computer (see 5.2, p. 148).
2. Open the folder Drivers containing the installer.
3. Start the installer by double-clicking its icon (Figure 167, p. 150).

ICx RNDIS Setup.exe

Figure 167. ICx RNDIS driver installer

4. Follow the instructions given on-screen (Figure 168, p. 150).

If an ICx RNDIS driver is already installed on your PC, you will be guided through the deinstallation before the installation begins.



Welcome

Welcome to the installer for the
ICx USB RNDIS Driver 1.0

It is strongly recommended that you exit all Windows programs before continuing with this installation.

If you have any other programs running, please click Cancel, close the programs, and run this setup again.

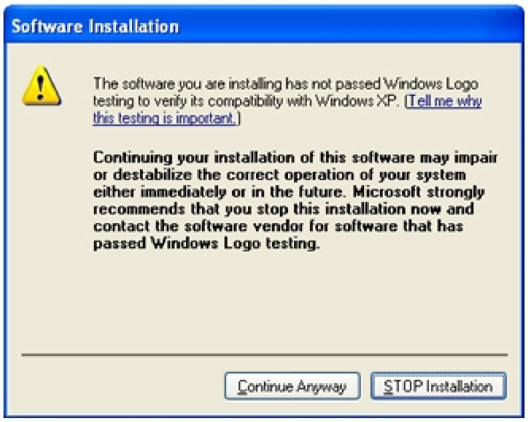
Otherwise please click Install to proceed with the installation.

Figure 168. Beginning of the installation

5. You might get asked whether to install this software (Figure 169, p. 151).

   Please click Continue Anyway .

   The installation will finish in a few moments (Figure 170, p. 151).
6. Stop the mass storage connection from the ICx identiFINDER 2 to your computer (see 5.2, p. 148).

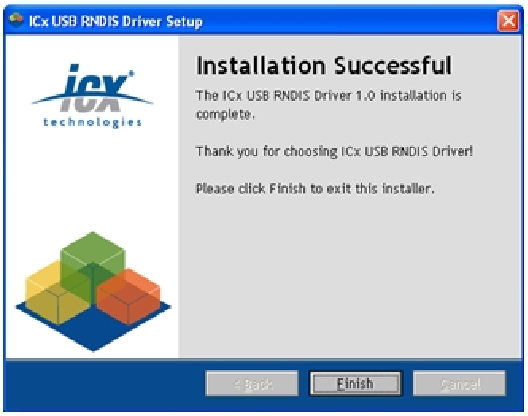


Software Installation

The software you are installing has not passed Windows Logo testing to verify its compatibility with Windows XP. (Tell me why this testing is important.)

Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the software vendor for software that has passed Windows Logo testing.

Figure 169. Installation warning



ICx USB RNDIS Driver Setup

Installation Successful

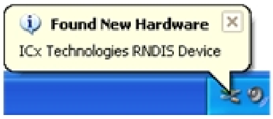
The ICx USB RNDIS Driver 1.0 installation is complete.

Thank you for choosing ICx USB RNDIS Driver!

Please click Finish to exit this installer.

Figure 170. End of the installation

Whenever you connect a computer and an ICx identiFINDER 2 which is not in the USB mass storage mode, the ICx identiFINDER 2 identifies itself as an RNDIS device. A computer running Microsoft Windows XP detecting the device checks whether the device is known and will report the detection of new hardware if not (Figure 171, p. 152).



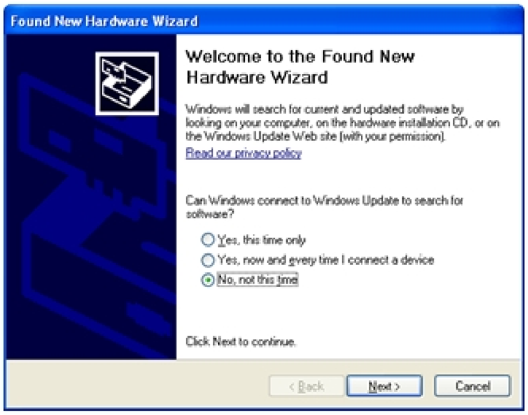
Found New Hardware

ICx Technologies RNDIS Device

Figure 171. Windows XP reporting new hardware at the notification area.

➔ To install the software for new hardware. . .

Windows launches the wizard for new hardware (Figure 172, p. 152).



Found New Hardware Wizard

Welcome to the Found New Hardware Wizard

Windows will search for current and updated software by looking on your computer, on the hardware installation CD, or on the Windows Update Web site (with your permission).

Read our privacy policy

Can Windows connect to Windows Update to search for software?

○ Yes, this time only

○ Yes, now and every time I connect a device

● No, not this time

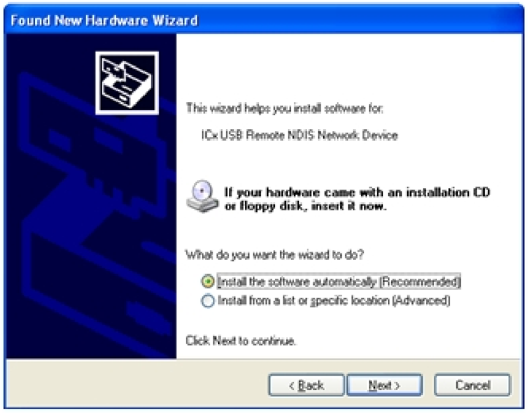
Click Next to continue.

Figure 172. Windows XP New Hardware Wizard

1. Click ● No, not this time to avoid searching the Internet for a driver.
2. Proceed to the following page (Figure 173, p. 153) by clicking Next .
3. Click ● Install the software automatically (Recommended) to have the system search for the driver you installed as described above.
4. Proceed to the following page by clicking Next .
5. You might get asked whether to install this software (Figure 174, p. 153).

   Please click Continue Anyway .

   The installation will finish in a few moments and you get notified in the notification area (Figure 175, p. 153).



This wizard helps you install software for:

ICx USB Remote NDIS Network Device

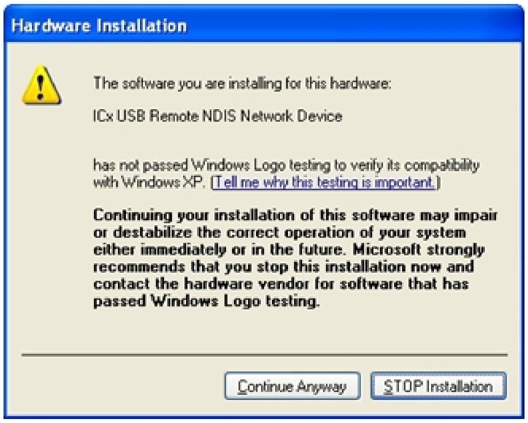
If your hardware came with an installation CD or floppy disk, insert it now.

What do you want the wizard to do?

● Install the software automatically (Recommended)
○ Install from a list or specific location (Advanced)

Click Next to continue.

Figure 173. Specifying a driver source



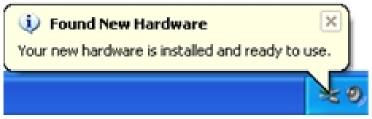
The software you are installing for this hardware:

ICx USB Remote NDIS Network Device

has not passed Windows Logo testing to verify its compatibility with Windows XP. (Tell me why this testing is important.)

Continuing your installation of this software may impair or destabilize the correct operation of your system either immediately or in the future. Microsoft strongly recommends that you stop this installation now and contact the hardware vendor for software that has passed Windows Logo testing.

Figure 174. Installation warning



Your new hardware is installed and ready to use.

Figure 175. End of the installation

6. You are now ready to use the web interface of your ICx identiFINDER 2 (see 6, p. 159).

   You will have to repeat these steps for every ICx identiFINDER 2 you connect to your computer, sometimes even if you connect the same instrument to a different USB port of your computer.

➔ To remove the driver software. . .

1. Open the Windows System Control Panel.
2. Open Add/Remove Software.
3. Select the ICx RNDIS Driver from the list by clicking its entry.
4. Click Remove and follow the instructions given on-screen.

5.3.3 WINDOWS VISTA, WINDOWS 7

You must install the driver software included within the ICx identiFINDER 2 before you can use the USB network connection of the ICx identiFINDER 2.

Microsoft Windows Vista and Windows 7 behave virtually identical regarding this installation. The following screenshots are taken from Windows 7.

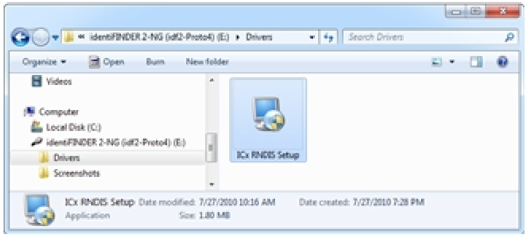
⚠ This installation requires you to have administrator privileges for your computer. Ask your IT administrator if in doubt.

The driver installer is included with the ICx identiFINDER 2, you can access it via the USB mass storage mode (5.2, p. 148).

➔ To install the driver software. . .

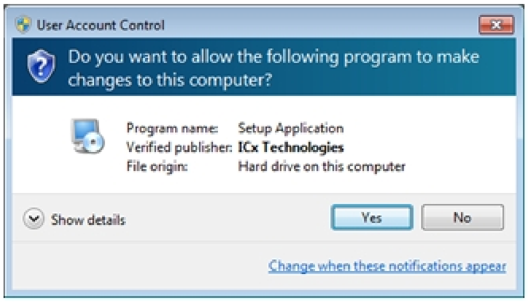
1. Start the mass storage connection from the ICx identiFINDER 2 to your computer (see 5.2, p. 148).
2. Open the folder Drivers containing the installer.
3. Start the installer by double clicking its icon (Figure 176, p. 155).
4. You will be asked whether you want to allow the installation of software (Figure 177, p. 155).
   Please click Yes .
5. Follow the instructions given on-screen (Figure 178, p. 155).

   If an ICx RNDIS driver is already installed on your PC, you will be guided through the deinstallation before the installation begins.


identiFINDER 2-NG (idf2-Proto4) (E:) ▸ Drivers
Search Drivers
Organize
Open
Burn
New folder
Videos
Computer
Local Disk (C:)
identiFINDER 2-NG (idf2-Proto4) (E:)
Drivers
Screenshots
ICx RNDIS Setup

ICx RNDIS Setup Date modified: 7/27/2010 10:16 AM Date created: 7/27/2010 7:28 PM
Application Size: 1.80 MB

Figure 176. ICx RNDIS driver installer

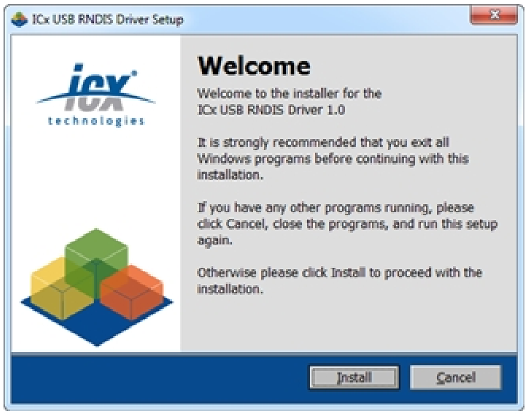

User Account Control

Do you want to allow the following program to make changes to this computer?

Program name: Setup Application
Verified publisher: **ICx Technologies**
File origin: Hard drive on this computer

Show details
Yes
No
Change when these notifications appear

Figure 177. Installation warning


ICx USB RNDIS Driver Setup
icx technologies
Install
Cancel

Welcome

Welcome to the installer for the ICx USB RNDIS Driver 1.0

It is strongly recommended that you exit all Windows programs before continuing with this installation.

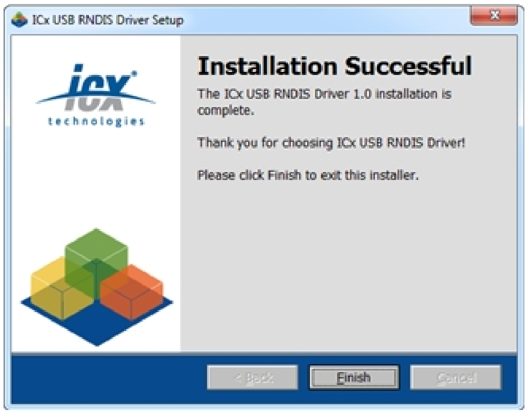
If you have any other programs running, please click Cancel, close the programs, and run this setup again.

Otherwise please click Install to proceed with the installation.

Figure 178. Beginning of the installation

The installation will finish in a few moments (Figure 179, p. 156).

6. Stop the mass storage connection from the ICx identiFINDER 2 to your computer (see 5.2, p. 148).



ICx USB RNDIS Driver Setup

Installation Successful

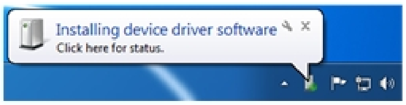
The ICx USB RNDIS Driver 1.0 installation is complete.

Thank you for choosing ICx USB RNDIS Driver!

Please click Finish to exit this installer.

Figure 179. End of the installation

Whenever you connect a computer and an ICx identiFINDER 2 which is not in the USB mass storage mode, the ICx identiFINDER 2 identifies itself as an RNDIS device. A computer running Microsoft Windows Vista or Windows 7 detecting the device checks whether the device is known and will report the detection of new hardware if not (Figure 180, p. 156).

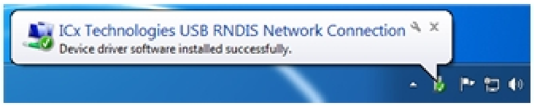


Installing device driver software

Click here for status.

Figure 180. Windows 7 reporting new hardware at the notification area.

The system installs the driver software for the device and reports when the device is ready to use in the notification area (Figure 181, p. 156).



ICx Technologies USB RNDIS Network Connection

Device driver software installed successfully.

Figure 181. End of the installation

You are now ready to use the web interface if your ICx identiFINDER 2 (see 6, p. 159).

➔ To remove the driver software. . .

1. Open the Windows System Control Panel.
2. Open Add/Remove Software.
3. Select the ICx RNDIS Driver from the list by clicking its entry.
4. Click Remove and follow the instructions given on-screen.

6 Using the ICx identiFINDER 2 Web Server

When you connect the ICx identiFINDER 2 to a computer appropriately configured (see 5.3, p. 148), it will show its IP address (Figure 151, p. 131).

To access the ICx identiFINDER 2's web interface, simply point your web browser to that address, for example http://172.16.0.1

You can use any modern browser. The following examples were successfully tested:

- Apple Safari 5 (Microsoft Windows)
- Google Chrome 5 (Linux, Microsoft Windows)
- Microsoft Internet Explorer 8 (Microsoft Windows)
- Mozilla Firefox 3.6 (Linux, Microsoft Windows)
- Opera 10.6 (Microsoft Windows)

The ICx identiFINDER 2 web access needs no cookies. If cookies are allowed, they are used to remember your settings, for example the number of items you prefer in listings.

JavaScript is required only for a few features (Live Screen, see 6.17, p. 192, or Spectrum, see 6.16, p. 190) but we recommend to activate JavaScript for a better overall experience like preview inserts when you hover over downloadable items.

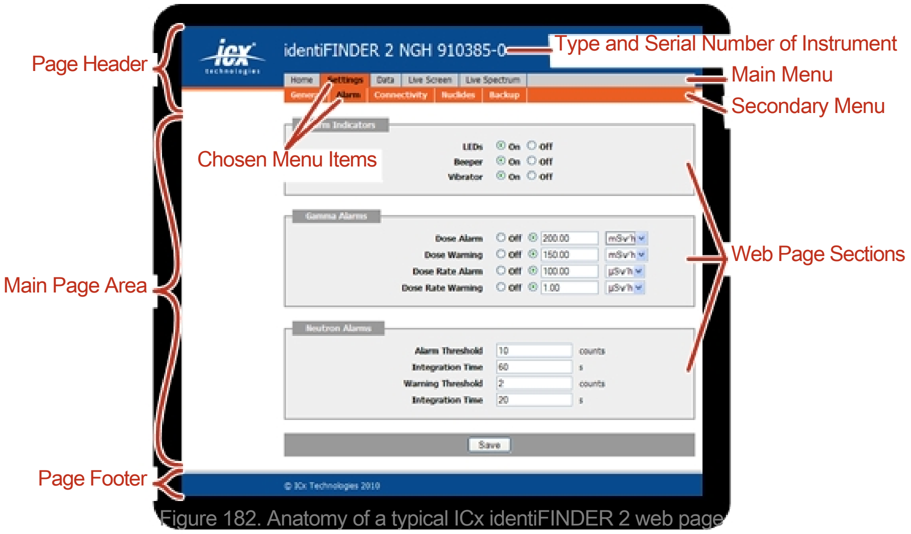
In principle, the web interface provides all the settings and commands you know from the ICx identiFINDER 2 itself, but with the added convenience of a larger screen and a real keyboard.

For some settings it makes no sense to change them via the web interface, for example the password (protects against illegal web access), the clock (setting might be overruled by GPS) or the subnet (would break the browser connection).

6.1 OPERATING THE WEB SERVER PAGES

The structure of a typical web page of the ICx identiFINDER 2 is illustrated in Figure 182, p. 160.

The colors used on the web pages are connected to the color setting of the ICx identiFINDER 2 (see 4.15, p. 94). Screenshots of the web interface in this manual are shown using the “ Daytime” colors.


Page Header
identiFINDER 2 NGH 910385-0
Type and Serial Number of Instrument
Home
Settings
Data
Live Screen
Live Spectrum
Main Menu
General
Alarm
Connectivity
Nuclides
Backup
Secondary Menu
Chosen Menu Items
Main Page Area
Web Page Sections
Save
© ICx Technologies 2010
Page Footer

Alarm Indicators

LEDs ● On ○ Off
Beeper ● On ○ Off
Vibrator ● On ○ Off

Gamma Alarms

Dose Alarm ○ Off ● 200.00 mSv/h
Dose Warning ○ Off ● 150.00 mSv/h
Dose Rate Alarm ○ Off ● 100.00 µSv/h
Dose Rate Warning ○ Off ● 1.00 µSv/h

Neutron Alarms

Alarm Threshold 10 counts
Integration Time 60 s
Warning Threshold 2 counts
Integration Time 20 s

Figure 182. Anatomy of a typical ICx identiFINDER 2 web page

The instrument serving these web pages is identified in the page header, which also contains the main and secondary menus. The offerings of the secondary menu are adjusted to the item chosen in the main menu.

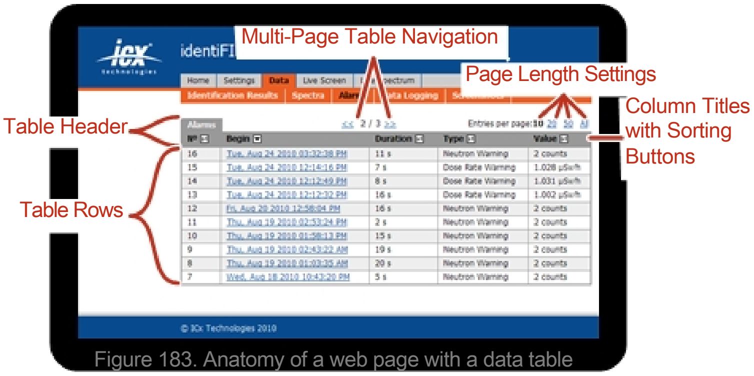
If you print a web page, the menus are suppressed.

The web page you chose in the menus is shown in the main area below the page header. The content of most web pages is divided into sections of related items.

A tool tip giving details about elements of web pages is shown if you hover and stay with the pointer above an element.

6.1.1 TABLES ON WEB PAGES

Some web pages (e.g., Figure 183, p. 161) show tables of stored data sets available for download from the ICx identiFINDER 2 to your computer.


identiFI
Multi-Page Table Navigation
Page Length Settings
Column Titles with Sorting Buttons
Table Header
Table Rows
Home
Settings
Data
Live Screen
Spectrum
Identification Results
Spectra
Alarms
Data Logging
Alarms
<< 2 / 3 >>
Entries per page: 10 20 50 All
© ICx Technologies 2010

Nº	Begin	Duration	Type	Value
16	Tue, Aug 24 2010 03:32:38 PM	11 s	Neutron Warning	2 counts
15	Tue, Aug 24 2010 12:14:16 PM	7 s	Dose Rate Warning	1.028 µSv/h
14	Tue, Aug 24 2010 12:12:49 PM	8 s	Dose Rate Warning	1.031 µSv/h
13	Tue, Aug 24 2010 12:12:32 PM	16 s	Dose Rate Warning	1.002 µSv/h
12	Fri, Aug 20 2010 12:58:04 PM	16 s	Neutron Warning	2 counts
11	Thu, Aug 19 2010 02:53:24 PM	2 s	Neutron Warning	2 counts
10	Thu, Aug 19 2010 01:58:13 PM	15 s	Neutron Warning	2 counts
9	Thu, Aug 19 2010 02:43:22 AM	19 s	Neutron Warning	2 counts
8	Thu, Aug 19 2010 01:03:35 AM	20 s	Neutron Warning	2 counts
7	Wed, Aug 18 2010 10:43:20 PM	5 s	Neutron Warning	2 counts

Figure 183. Anatomy of a web page with a data table

You can select the maximum number of table rows shown per web page in the header above the table.

The current page length is remembered on your computer if cookies are allowed.

Depending on your page length setting and the total number of table entries, a table might be split across multiple pages which you can navigate using the elements in the table header.

You can have the table sorted by columns. The current sorting status is indicated by an icon in the column title.

⧓ Table is not sorted by this column.

▲ Table is sorted ascending by this column.

▼ Table is sorted descending by this column.

Click an icon to change table sorting.

The current sorting is remembered on your computer if cookies are allowed.

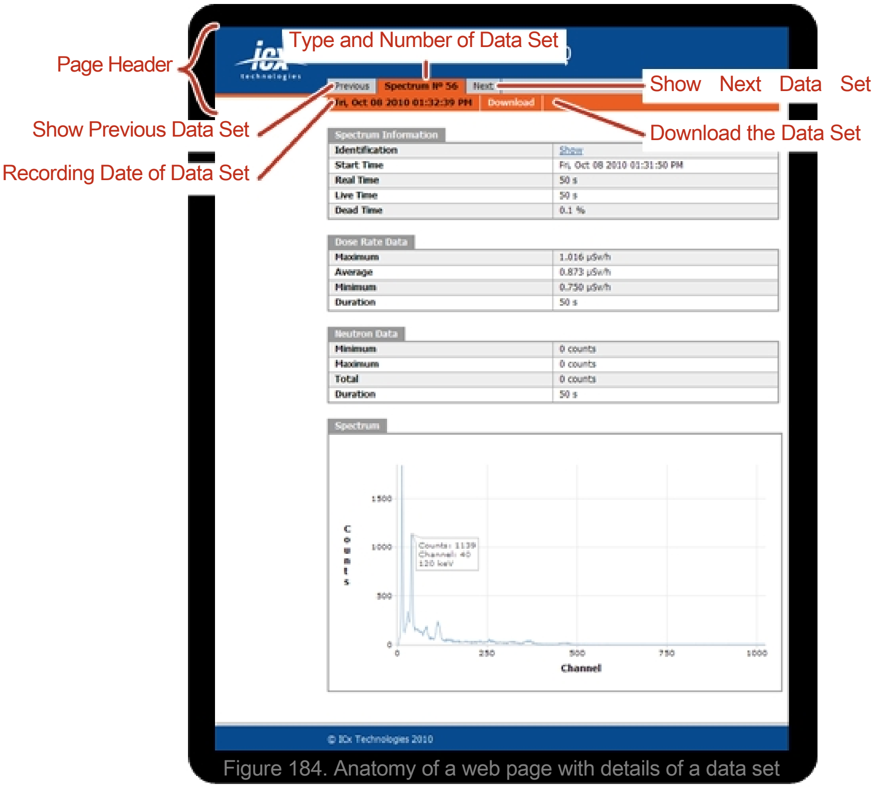
6.1.2 DATA SETS ON WEB PAGES

The header of web pages showing data sets on the ICx identiFINDER 2 (Figure 184, p. 162) differs from all the other web pages.

The main menu is replaced by the type and number of the shown data set bracketed by a pair of action buttons to proceed to the next or previous data set of the same type.

The secondary menu is replaced by the recording date of the shown data set and an action button for downloading the data set.

If you download the data set, the name of the file will contain the type and number of the data set and the serial number of the ICx identiFINDER 2, for example spectrum report 71 (910385- 0).zip


Page Header
Type and Number of Data Set
Show Next Data Set
Show Previous Data Set
Download the Data Set
Recording Date of Data Set
icx technologies
Previous
Spectrum № 56
Next
Fri, Oct 08 2010 01:32:39 PM
Download
Spectrum
1500
1000
500
0
Counts
Counts: 1139
Channel: 40
120 keV
0
250
500
750
1000
Channel
© ICx Technologies 2010

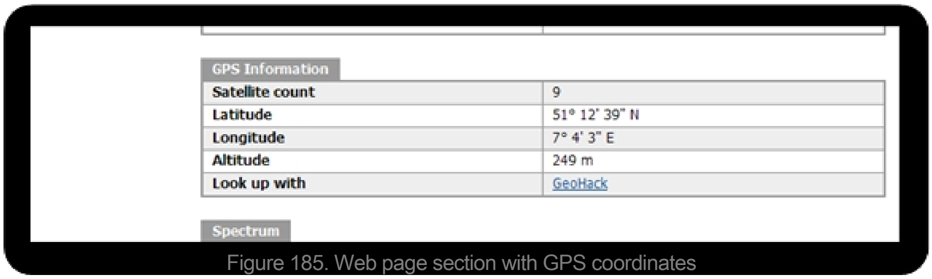
Spectrum Information	
Identification	Show
Start Time	Fri, Oct 08 2010 01:31:50 PM
Real Time	50 s
Live Time	50 s
Dead Time	0.1 %

Dose Rate Data	
Maximum	1.016 µSv/h
Average	0.873 µSv/h
Minimum	0.750 µSv/h
Duration	50 s

Neutron Data	
Minimum	0 counts
Maximum	0 counts
Total	0 counts
Duration	50 s

Figure 184. Anatomy of a web page with details of a data set

If GPS coordinates were stored with a data set, they are shown in an additional section of the details page (Figure 185, p. 163).



GPS Information

Satellite count	9
Latitude	51° 12' 39" N
Longitude	7° 4' 3" E
Altitude	249 m
Look up with	GeoHack

Spectrum

Figure 185. Web page section with GPS coordinates

The hyperlink labeled “ Look up with” below the coordinates leads to the GeoHack page on the Wikimedia Toolserver, a free service of Wikimedia Deutschland e.V. (Internet access required).

The service links to international servers of maps, satellite images, aerial photographs etc. which cover the coordinates saved with your data set.

6.2 OUTLINE OF THE WEB SERVER PAGES

The main menu offers the following groups of web pages:

Home

Inspect general information about the ICx identiFINDER 2

Settings

Inspect and edit settings of the ICx identiFINDER 2

Data

Inspect and download data from the ICx identiFINDER 2's database

Live Screen

Remote control the screen and buttons of the ICx identiFINDER 2

Live Spectrum

Acquire and analyze gamma spectra with the ICx identiFINDER 2

The complete hierarchy of web pages in the main and secondary menus and their sections is shown in the following list. References point to the manual sections explaining the listed items in more detail.

Home

- Info .... see 6.4, p. 166
  - System .... see 6.4.1, p. 166
  - Service .... see 6.4.2, p. 166
- Resources .... see 6.5, p. 167
  - Manuals .... see 6.5.1, p. 167
  - Open Source Software .... see 6.5.2, p. 168

Settings

- General .... see 6.6, p. 168
  - Measurement .... see 6.6.1, p. 169
  - Identification .... see 6.6.2, p. 170
  - GPS .... see 6.6.3, p. 170
  - User Interface .... see 6.6.4, p. 170
- Alarm .... see 6.7, p. 171
  - Alarm Indicators .... see 6.7.1, p. 171

    - Gamma Alarms .... see 6.7.2, p. 171
    - Neutron Alarms .... see 6.7.3, p. 172
  - Connectivity .... see 6.8, p. 173
    - Local Area Network.. see 6.8.1, p. 174
    - Remote Server .... see 6.8.2, p. 174
    - Reports .... see 6.8.3, p. 174
  - Nuclides .... see 6.9, p. 175
  - Backup .... see 6.10, p. 176
    - Backup.. see 6.10.1, p. 177
    - Restore .... see 6.10.2, p. 178

Data

  - Identification Results .... see 6.11, p. 179
  - Spectra.. see 6.12, p. 182
  - Alarms.. see 6.13, p. 185
  - Data Logging .... see 6.14, p. 187
  - Screenshots.. see 6.15, p. 189
- Live Screen..see 6.16, p. 190
- Live Spectrum.. see 6.17, p. 192

6.3 PASSWORD ENTRY

An optional (4.20, p. 102) password may protect against unauthorized or accidental access to advanced settings and commands of your ICx identiFINDER 2.

If a password is set (4.19, p. 101), you have to enter it in the instrument (see 4.6, p. 73) or in the web interface (Figure 186, p. 166) to gain access.

When entering the ICx identiFINDER 2 password via the web interface type “ L” , “ M” , or “ R” (upper case).

After entering the correct password, access is granted until you switch off your ICx identiFINDER 2 (2.4, p. 33).

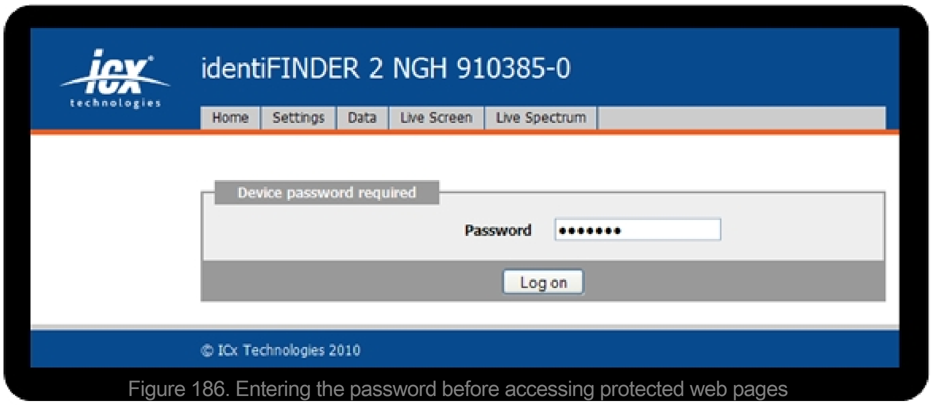

icx technologies
identiFINDER 2 NGH 910385-0
Home
Settings
Data
Live Screen
Live Spectrum
Device password required
Password
•••••••
Log on
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Figure 186. Entering the password before accessing protected web pages

6.4 INFO (WEB PAGE)

Home (p. 164) ➢ Info

This web page displays diverse information regarding your ICx identiFINDER 2 (Figure 187, p. 167).

6.4.1 SYSTEM

Home (p. 164) ➢ Info (p. 166) ➢ System

Options Menu (p. 69) ➢ More Options (p. 69) ➢ Advanced Options (p. 70) ➢ Maintenance (p. 70) ➢ Show Status (p. 103)

This section (Figure 187, p. 167) contains information about the ICx identiFINDER 2 and its configuration.

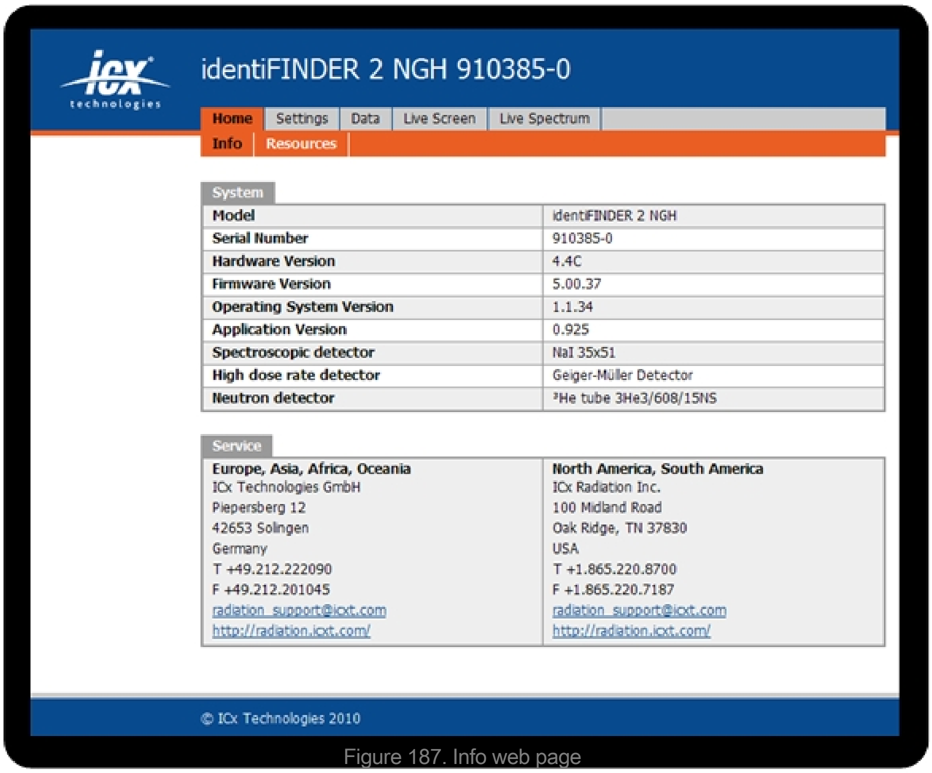
You should have this information ready when contacting our service (see 6.4.2, p. 166 or A.3, p. 237).

6.4.2 SERVICE

Home (p. 164) ➢ Info (p. 166) ➢ Service

This section (Figure 187, p. 167) contains the addresses of our service for various communication methods like traditional mail, fax, etc.

If you click the link to a service e-mail address, your standard e-mail software will open with a new message already containing the rele-



identiFINDER 2 NGH 910385-0

System

Model	identiFINDER 2 NGH
Serial Number	910385-0
Hardware Version	4.4C
Firmware Version	5.00.37
Operating System Version	1.1.34
Application Version	0.925
Spectroscopic detector	NaI 35x51
High dose rate detector	Geiger-Müller Detector
Neutron detector	³He tube 3He3/608/15NS

Service

Europe, Asia, Africa, Oceania ICx Technologies GmbH Piepersberg 12 42653 Solingen Germany T +49.212.222090 F +49.212.201045 radiation_support@icxt.com http://radiation.icxt.com/	**North America, South America** ICx Radiation Inc. 100 Midland Road Oak Ridge, TN 37830 USA T +1.865.220.8700 F +1.865.220.7187 radiation_support@icxt.com http://radiation.icxt.com/

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Figure 187. Info web page

vant data of the ICx identiFINDER 2 like serial number, versions etc.

6.5 RESOURCES (WEB PAGE)

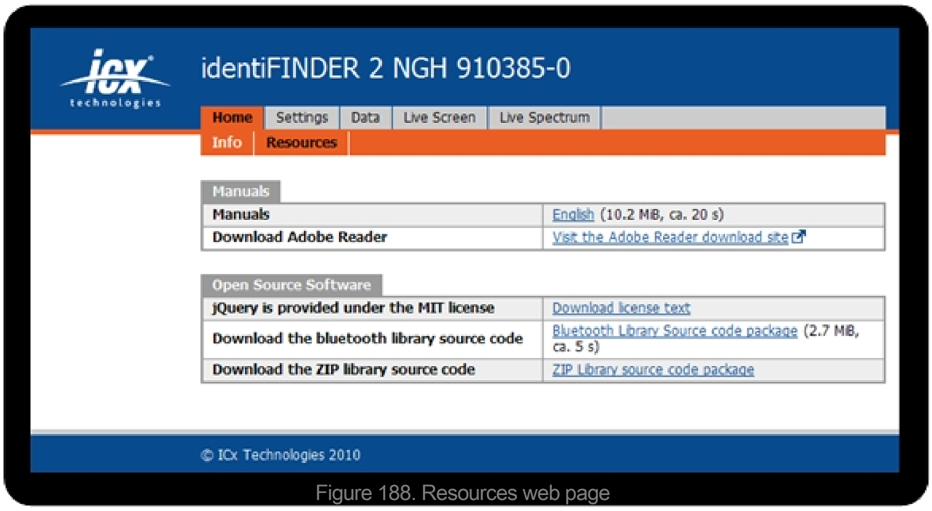
Home (p. 164) ➢ Resources

This web page (Figure 188, p. 168) provides access to various resources stored on the ICx identiFINDER 2.

6.5.1 MANUALS

Home (p. 164) ➢ Resources (p. 167) ➢ Manuals

This manual is included on the ICx identiFINDER 2 in several languages as PDF files. This web page section (Figure 188, p. 168) provides hyperlinks for downloading manuals to your computer.



identiFINDER 2 NGH 910385-0

Manuals	
Manuals	English (10.2 MB, ca. 20 s)
Download Adobe Reader	Visit the Adobe Reader download site

Open Source Software	
jQuery is provided under the MIT license	Download license text
Download the bluetooth library source code	Bluetooth Library Source code package (2.7 MB, ca. 5 s)
Download the ZIP library source code	ZIP Library source code package

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Figure 188. Resources web page

An additional hyperlink points to an Internet site for downloading PDF viewing software if you don't already have one.

6.5.2 OPEN SOURCE SOFTWARE

Home (p. 164) ➢ Resources (p. 167) ➢ Open Source Software

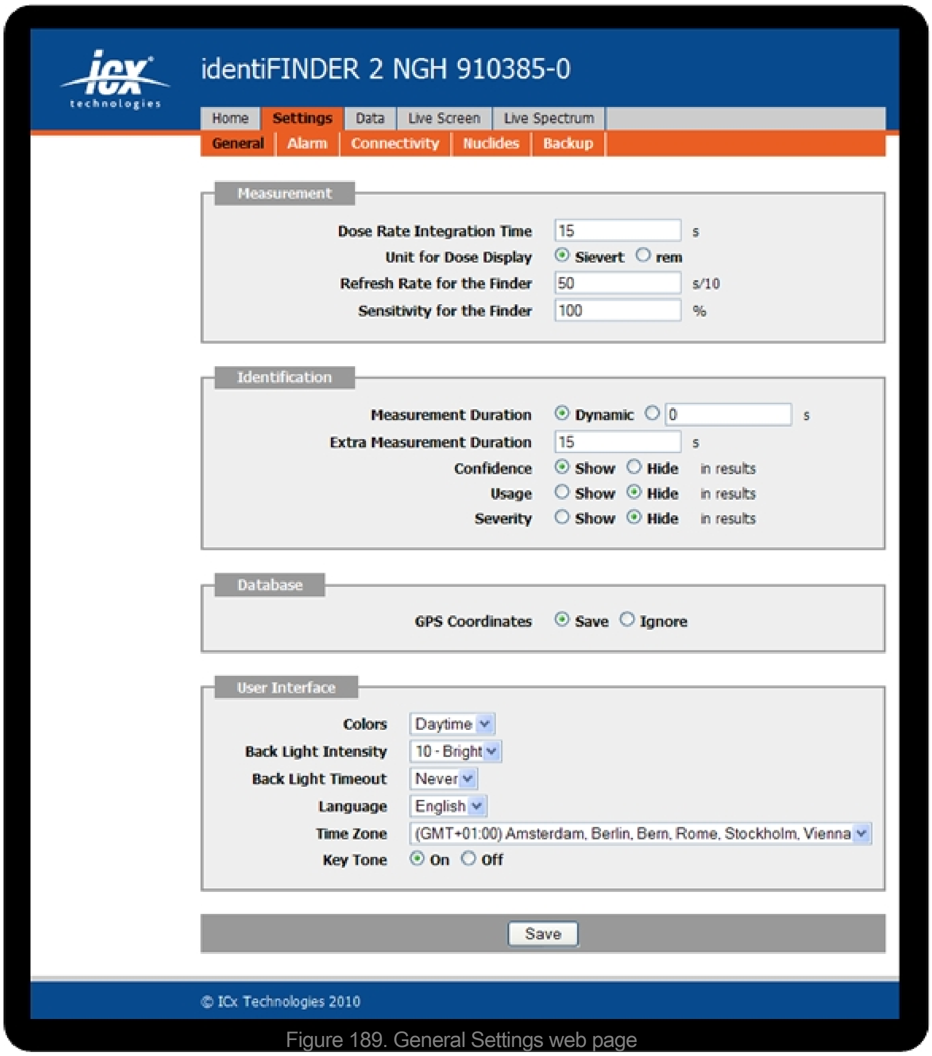
This section (Figure 188, p. 168) provides information about the open-source libraries used in the software of the ICx identiFINDER 2. Hyperlinks connect to the license or the source code of each library so you can download it from the ICx identiFINDER 2 to your computer.

6.6 GENERAL (WEB PAGE)

Settings (p. 164) ➢ General

This web page (Figure 189, p. 169) provides access to various settings of the ICx identiFINDER 2 for inspection or editing.

To transfer your changes to the ICx identiFINDER 2, click Save .


icx technologies
Home
Settings
Data
Live Screen
Live Spectrum
General
Alarm
Connectivity
Nuclides
Backup
Save

identiFINDER 2 NGH 910385-0

Measurement

Dose Rate Integration Time 15 s
Unit for Dose Display ● Sievert ○ rem
Refresh Rate for the Finder 50 s/10
Sensitivity for the Finder 100 %

Identification

Measurement Duration ● Dynamic ○ 0 s
Extra Measurement Duration 15 s
Confidence ● Show ○ Hide in results
Usage ○ Show ● Hide in results
Severity ○ Show ● Hide in results

Database

GPS Coordinates ● Save ○ Ignore

User Interface

Colors Daytime
Back Light Intensity 10 - Bright
Back Light Timeout Never
Language English
Time Zone (GMT+01:00) Amsterdam, Berlin, Bern, Rome, Stockholm, Vienna
Key Tone ● On ○ Off

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Figure 189. General Settings web page

6.6.1 MEASUREMENT

Settings (p. 164) ➣ General (p. 168) ➣ Measurement

This web page section (Figure 189, p. 169) lets you inspect or edit settings related to the measurement of gamma radiation.

You can access these settings on the instrument as well. Please find the details about the settings in chapter " ICx identiFINDER 2 Reference" under

Options Menu (p. 69) ➢ More Options (p. 69) ➢ Advanced Options (p. 70) ➢ Calibration Source (p. 111)

Options Menu (p. 69) ➢ Dose Rate Settings (p. 137)

Options Menu (p. 69) ➢ Finder Settings (p. 135)

6.6.2 IDENTIFICATION

Settings (p. 164) ➢ General (p. 168) ➢ Identification

This web page section (Figure 189, p. 169) lets you inspect or edit settings regarding measurement and presentation of identification results.

You can access these settings on the instrument as well. Please find the details about the settings in chapter " ICx identiFINDER 2 Reference" under

Options Menu (p. 69) ➢ More Options (p. 69) ➢ Identification Options (p. 69) ➢ Identification Settings (p. 85)

6.6.3 GPS

Settings (p. 164) ➢ General (p. 168) ➢ GPS

This web page section (Figure 189, p. 169) lets you inspect or edit settings regarding the storage of values in the ICx identiFINDER 2's database.

You can access these settings on the instrument as well. Please find the details about the settings in chapter " ICx identiFINDER 2 Reference" under

Options Menu (p. 69) ➢ More Options (p. 69) ➢ Advanced Options (p. 70) ➢ General Options (p. 70) ➢ GPS Settings (p. 100)

6.6.4 USER INTERFACE

Settings (p. 164) ➢ General (p. 168) ➢ User Interface

This web page section (Figure 189, p. 169) lets you inspect or edit settings regarding the screen, clock, and keyboard of the ICx identiFINDER 2.

You can access these settings on the instrument as well. Please find the details about the settings in chapter " ICx identiFINDER 2 Reference" under

- Options Menu (p. 69) ➢ More Options (p. 69) ➢ Advanced Options (p. 70) ➢ General Options (p. 70) ➢ Display Settings (p. 94)
- Options Menu (p. 69) ➢ More Options (p. 69) ➢ Advanced Options (p. 70) ➢ General Options (p. 70) ➢ Clock Settings (p. 97)
- Options Menu (p. 69) ➢ More Options (p. 69) ➢ Advanced Options (p. 70) ➢ General Options (p. 70) ➢ Feedback Settings (p. 99)

The colors setting affects not only the screen of the ICx identiFINDER 2 but the web interface too. Printing web pages is not affected.

6.7 ALARM (WEB PAGE)

Settings (p. 164) ➢ Alarm

This web page (Figure 190, p. 172) provides access to alarm settings of the ICx identiFINDER 2 for inspection or editing.

To transfer your changes to the ICx identiFINDER 2, click Save .

6.7.1 ALARM INDICATORS

Settings (p. 164) ➢ Alarm (p. 171) ➢ Alarm Indicators

This web page section (Figure 190, p. 172) lets you switch the alarm indicators of the ICx identiFINDER 2 on or off.

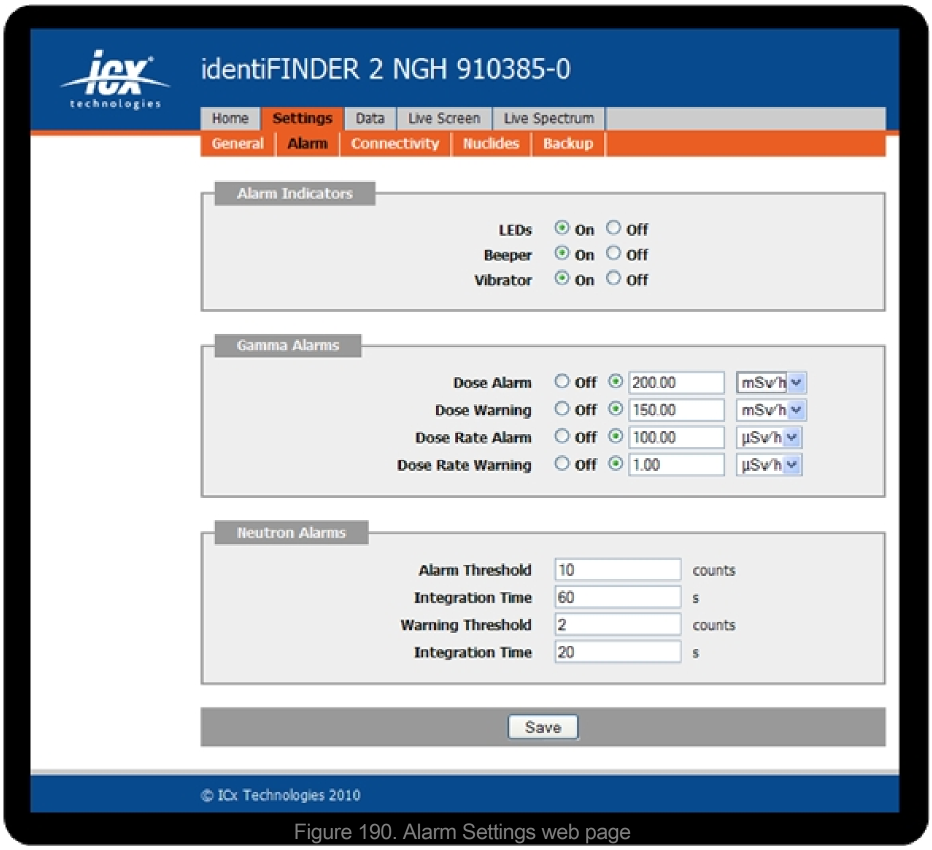
You can access these settings on the instrument as well. Please find the details about the settings in chapter " ICx identiFINDER 2 Reference" under

- Options Menu (p. 69) ➢ Alarm Options (p. 71) ➢ Alarm Indicators (p. 138)

6.7.2 GAMMA ALARMS

Settings (p. 164) ➢ Alarm (p. 171) ➢ Gamma Alarms

This web page section (Figure 190, p. 172) lets you inspect or set the thresholds for gamma alarms and warnings.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Save
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identiFINDER 2 NGH 910385-0

Alarm Indicators

LEDs ● On ○ Off
Beeper ● On ○ Off
Vibrator ● On ○ Off

Gamma Alarms

Dose Alarm ○ Off ● 200.00 mSv/h
Dose Warning ○ Off ● 150.00 mSv/h
Dose Rate Alarm ○ Off ● 100.00 µSv/h
Dose Rate Warning ○ Off ● 1.00 µSv/h

Neutron Alarms

Alarm Threshold 10 counts
Integration Time 60 s
Warning Threshold 2 counts
Integration Time 20 s

Figure 190. Alarm Settings web page

You can access these settings on the instrument as well. Please find the details about the settings in chapter “ ICx identiFINDER 2 Reference” under

Options Menu (p. 69) ➢ Alarm Options (p. 71) ➢ Dose Alarm Thresholds (p. 139)

Options Menu (p. 69) ➢ Alarm Options (p. 71) ➢ Dose Rate Alarm Thresholds (p. 141)

6.7.3 NEUTRON ALARMS

Settings (p. 164) ➢ Alarm (p. 171) ➢ Neutron Alarms

Available only for models equipped with a neutron detector.

This web page section (Figure 190, p. 172) lets you inspect or set the thresholds for neutron alarms and warnings.

You can access these settings on the instrument as well. Please find the details about the settings in chapter "ICx identiFINDER 2 Reference" under

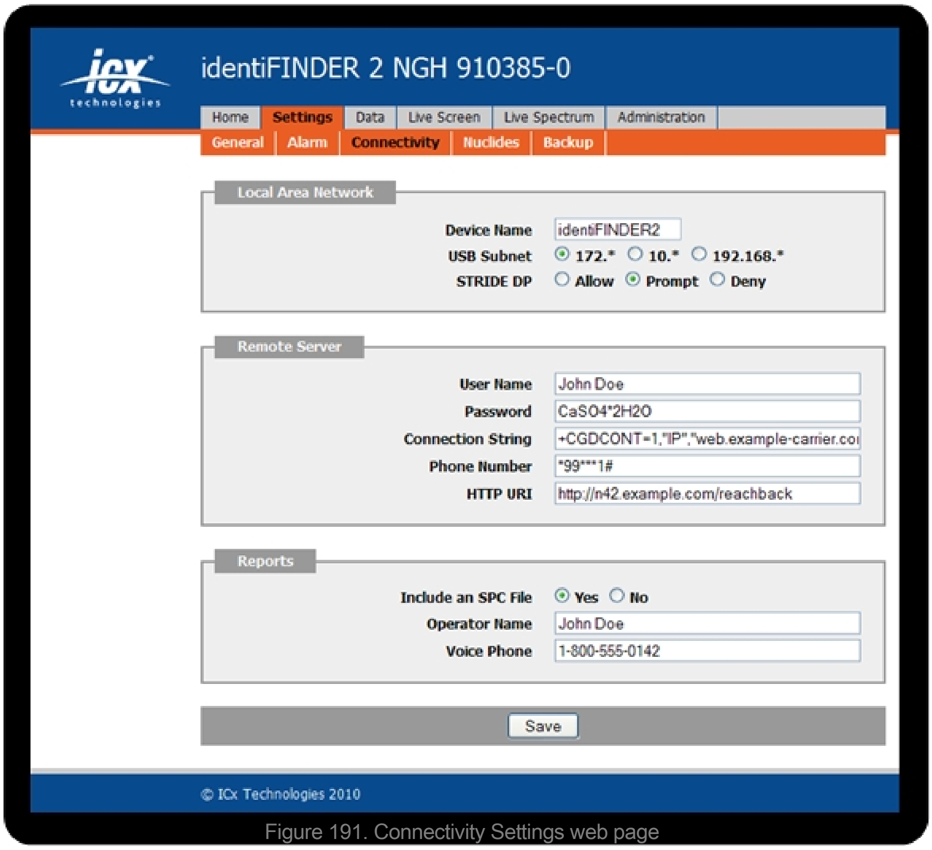
Options Menu (p. 69) ➢ Alarm Options (p. 71) ➢ Neutron Alarm Thresholds (p. 142)

6.8 CONNECTIVITY (WEB PAGE)

Settings (p. 164) ➢ Connectivity

This web page (Figure 191, p. 173) comprises various settings of the ICx identiFINDER 2 related to local and remote network connections.

To transfer your changes to the ICx identiFINDER 2, click Save .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Backup
Save
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identiFINDER 2 NGH 910385-0

Local Area Network

Device Name: identiFINDER2
USB Subnet: ● 172.* ○ 10.* ○ 192.168.*
STRIDE DP: ○ Allow ● Prompt ○ Deny

Remote Server

User Name: John Doe
Password: CaSO4*2H2O
Connection String: +CGDCONT=1,"IP","web.example-carrier.co
Phone Number: *99***1#
HTTP URI: http://n42.example.com/reachback

Reports

Include an SPC File: ● Yes ○ No
Operator Name: John Doe
Voice Phone: 1-800-555-0142

Figure 191. Connectivity Settings web page

6.8.1 LOCAL AREA NETWORK

Settings (p. 164) ➢ Connectivity (p. 173) ➢ Local Area Network

This web page section (Figure 191, p. 173) lets you configure the connection of the ICx identiFINDER 2 to a local area network.

You can access these settings on the instrument as well. Please find the details about the settings in chapter " ICx identiFINDER 2 Reference" under

Options Menu (p. 69) ➢ More Options (p. 69) ➢ Advanced Options (p. 70) ➢ Connectivity Options (p. 70) ➢ Network (p. 129)

⚠ Be careful with changing the USB Subnet, you might have to reestablish the web browser's connection to the ICx identiFINDER 2.

6.8.2 REMOTE SERVER

Settings (p. 164) ➢ Connectivity (p. 173) ➢ Remote Server

This web page section (Figure 191, p. 173) lets you configure the connection of the ICx identiFINDER 2 to remote server via Bluetooth Dial-Up Networking.

You can access these settings on the instrument as well. Please find the details about the settings in chapter " ICx identiFINDER 2 Reference" under

Options Menu (p. 69) ➢ More Options (p. 69) ➢ Advanced Options (p. 70) ➢ Connectivity Options (p. 70) ➢ Remote Server Settings (p. 126)

6.8.3 REPORTS

Settings (p. 164) ➢ Connectivity (p. 173) ➢ Reports

This web page section (Figure 191, p. 173) lets you configure the contents of reports generated by the ICx identiFINDER 2.

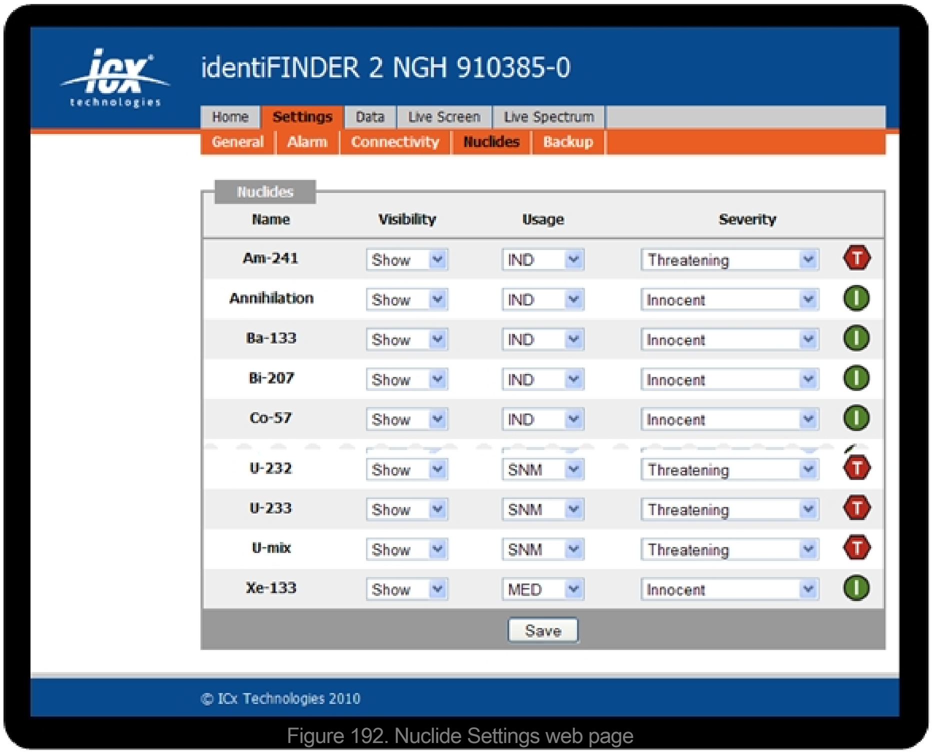
You can access these settings on the instrument as well. Please find the details about the settings in chapter " ICx identiFINDER 2 Reference" under

Options Menu (p. 69) ➢ More Options (p. 69) ➢ Advanced Options (p. 70) ➢ Connectivity Options (p. 70) ➢ Report Settings (p. 131)

6.9 NUCLIDES (WEB PAGE)

Settings (p. 164) ➢ Nuclides

This web page (Figure 192, p. 175) lets you inspect and change nuclide data.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Nuclides
Backup
Nuclides
Save
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Name	Visibility	Usage	Severity	
Am-241	Show	IND	Threatening	T
Annihilation	Show	IND	Innocent	I
Ba-133	Show	IND	Innocent	I
Bi-207	Show	IND	Innocent	I
Co-57	Show	IND	Innocent	I
U-232	Show	SNM	Threatening	T
U-233	Show	SNM	Threatening	T
U-mix	Show	SNM	Threatening	T
Xe-133	Show	MED	Innocent	I

Figure 192. Nuclide Settings web page

You can access these settings on the instrument as well. Please find the details about the settings in chapter “ ICx identiFINDER 2 Reference” under

Options Menu (p. 69) ➢ More Options (p. 69) ➢ Identification Options (p. 69) ➢ Nuclide Visibility (p. 87)

Options Menu (p. 69) ➢ More Options (p. 69) ➢ Identification Options (p. 69) ➢ Nuclide Usage (p. 88)

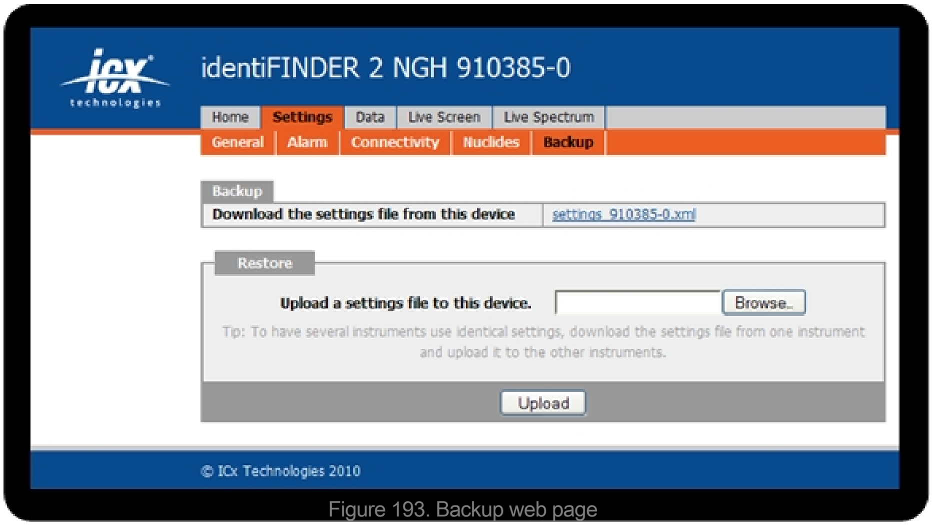
Options Menu (p. 69) ➢ More Options (p. 69) ➢ Identification Options (p. 69) ➢ Nuclide Severity (p. 89)

To transfer your changes to the ICx identiFINDER 2, click Save .

6.10 BACKUP (WEB PAGE)

Settings (p. 164) ➢ Backup

This web page (Figure 193, p. 176) lets you backup and restore the complete settings of the ICx identiFINDER 2.



identiFINDER 2 NGH 910385-0

Download the settings file from this device settings_910385-0.xml

Upload a settings file to this device.

Tip: To have several instruments use identical settings, download the settings file from one instrument and upload it to the other instruments.

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Figure 193. Backup web page

The instrument’s settings are saved in an *.xml file. You can inspect or edit this file (Figure 194, p. 177) with common text editors supporting UTF-8 or with specialized XML editors.

The settings in the file are grouped into several categories and embedded comments help you to find you way around.

You can use this file, for example, to

- backup the settings and restore them after you experiment with various settings on the instrument,
- document the settings used in your team, or
- distribute identical settings to several instruments used in your team.

Uploaded settings files may be incomplete, that is, they may contain only some settings. Using this method, you can distribute some set-

```
< ? xml  version = " 1 . 0 "  encoding = " utf - 8 " ? >
< settings  modelnumber = " identiFINDER      2- NGH "  serialnumber = " 9 1 0 3 8 5 - 0 " >
  < category  name = " Display " >

  < / category >
  < category  name = " Alarm  Indications " >
    < ! - - This  setting  controls  whether  the  system  beeps  in  case  of  an
         alarm . - - >
    < setting  name = " SoundAlarmIndication "  value = " True "  / >
    < ! - - This  setting  controls  whether  the  device  vibrates  during  an
         alarm . - - >
    < setting  name = " VibratorAlarmIndication "  value = " True "    / >
    < ! - - This  setting  controls  whether  the  front - side  LEDs  blink  during     an
         alarm . - - >
    < setting  name = " LightsAlarmIndication "  value = " True "    / >
  < / category >
  < category  name = " Feedback " >

  < / category >
  < category  name = " Nuclide " >
    < setting  name = " Am - 2 4 1 "  value = " True "  / >
    < setting  name = " Am - 2 4 1 - Usage "  value = " IND "  / >
    < setting  name = " Am - 2 4 1 - Severity "  value = " Threatening "    / >

    < setting  name = " Xe - 1 3 3 "  value = " True "  / >
    < setting  name = " Xe - 1 3 3 - Usage "  value = " MED "  / >
    < setting  name = " Xe - 1 3 3 - Severity "  value = " Innocent "    / >
  < / category >
< / settings >
```

Figure 194. Snippets from a settings-xyz.xml file.

tings to several instruments while other settings remain unchanged on the individual instrument.

The complete settings file of your ICx identiFINDER 2 is reproduced in the Inspection Report shipped with every product.

6.10.1 BACKUP

Settings (p. 164) ➢ Backup (p. 176) ➢ Backup

This web page section (Figure 193, p. 176) provides a hyperlink for downloading the settings file from the ICx identiFINDER 2. The file name contains the serial number of the instrument.

After you clicked the link, your web browser will download the file to your computer.

The exact procedure depends on your browser and its settings. When in doubt, refer to the manual of your browser.

6.10.2 RESTORE

Settings (p. 164) ➢ Backup (p. 176) ➢ Restore

This web page section (Figure 193, p. 176) lets you upload a settings file to the ICx identiFINDER 2.

You have to specify a settings file on your computer by entering the path into the text field or, more conveniently, by choosing one after you clicked Browse .

Click Upload to actually upload the file to the instrument.

The software of the ICx identiFINDER 2 will check the formal integrity of the file you uploaded.

If the uploaded file contains for example, syntax errors or unknown settings, the complete file will be rejected and the settings of the instrument will remain unchanged.

In other words: you cannot damage the ICx identiFINDER 2 by uploading a wrong or corrupt file. You can, however, upload a file with settings making no sense for your field of application.

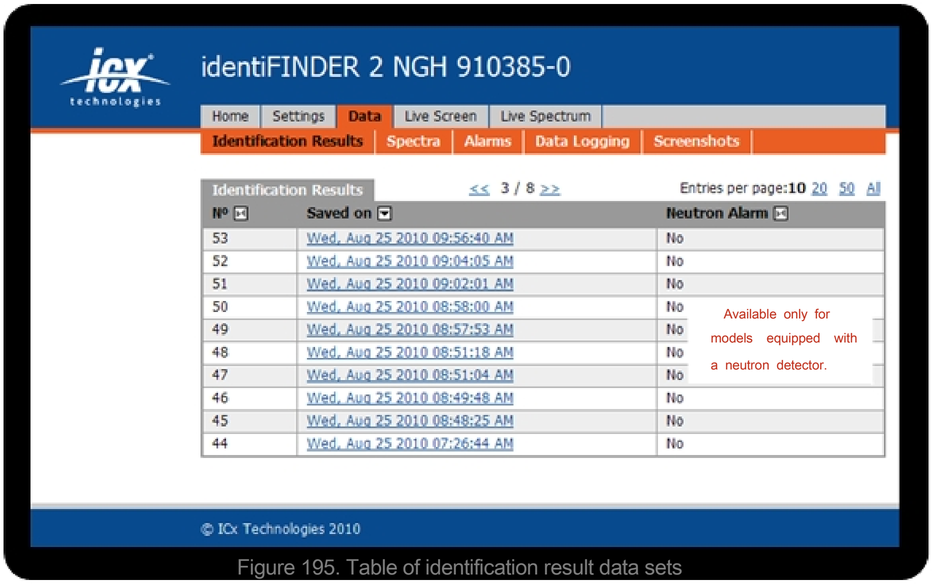
If the settings file contains data for settings not supported on your ICx identiFINDER 2, for instance a neutron warning threshold for an instrument without neutron detector, the setting will be accepted but is obviously meaningless.

You will be informed about success or failure after the upload.

6.11 IDENTIFICATION RESULTS (WEB PAGE)

Data (p. 165) ➢ Identification Results

This web page (Figure 195, p. 179) tabulates the identification results stored in the ICx identiFINDER 2's database (For the navigation of tables refer to section 6.1.1, p. 161).


icx technologies
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Live Spectrum
Identification Results
Spectra
Alarms
Data Logging
Screenshots
Identification Results
<< 3 / 8 >>
Entries per page:10 20 50 All
Available only for models equipped with a neutron detector.
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Nº	Saved on	Neutron Alarm
53	Wed, Aug 25 2010 09:56:40 AM	No
52	Wed, Aug 25 2010 09:04:05 AM	No
51	Wed, Aug 25 2010 09:02:01 AM	No
50	Wed, Aug 25 2010 08:58:00 AM	No
49	Wed, Aug 25 2010 08:57:53 AM	No
48	Wed, Aug 25 2010 08:51:18 AM	No
47	Wed, Aug 25 2010 08:51:04 AM	No
46	Wed, Aug 25 2010 08:49:48 AM	No
45	Wed, Aug 25 2010 08:48:25 AM	No
44	Wed, Aug 25 2010 07:26:44 AM	No

Figure 195. Table of identification result data sets

The table shows several columns for every identification result: Nº

The arbitrary reference number of the data set.

Saved on

The date and time of storage of the data set.

You can click this date to open a new web page or browser tab showing details (see 6.11.1, p. 180) of the data set.

Neutron Alarm

Shows whether a neutron alarm was raised during the measurement this identification result is based upon.

Available only for models equipped with a neutron detector.

6.11.1 IDENTIFICATION DETAILS (WEB PAGE)

You can view details for each identification data set by clicking the " Saved on" date in the table (Figure 195, p. 179).

The identification details are presented as a separate page (Figure 196, p. 181). For the navigation of data sets refer to section 6.1.2, p. 162 .

To download the shown data set, click Download and follow the directions given by your web browser.

The name of the downloaded *.zip archive will contain the type and number of the data set and the serial number of the ICx identiFINDER 2, for example Identification Report 81 (910385- 0).zip.

The downloaded archive contains files named after the saving date and time in several formats:

20100915_085311.n42

An XML file according to ANSI N42.42 2006 containing instrument information, the identification result, the measured spectrum and the spectrum of the intrinsic activity.

20100915_085311_measurement.spc

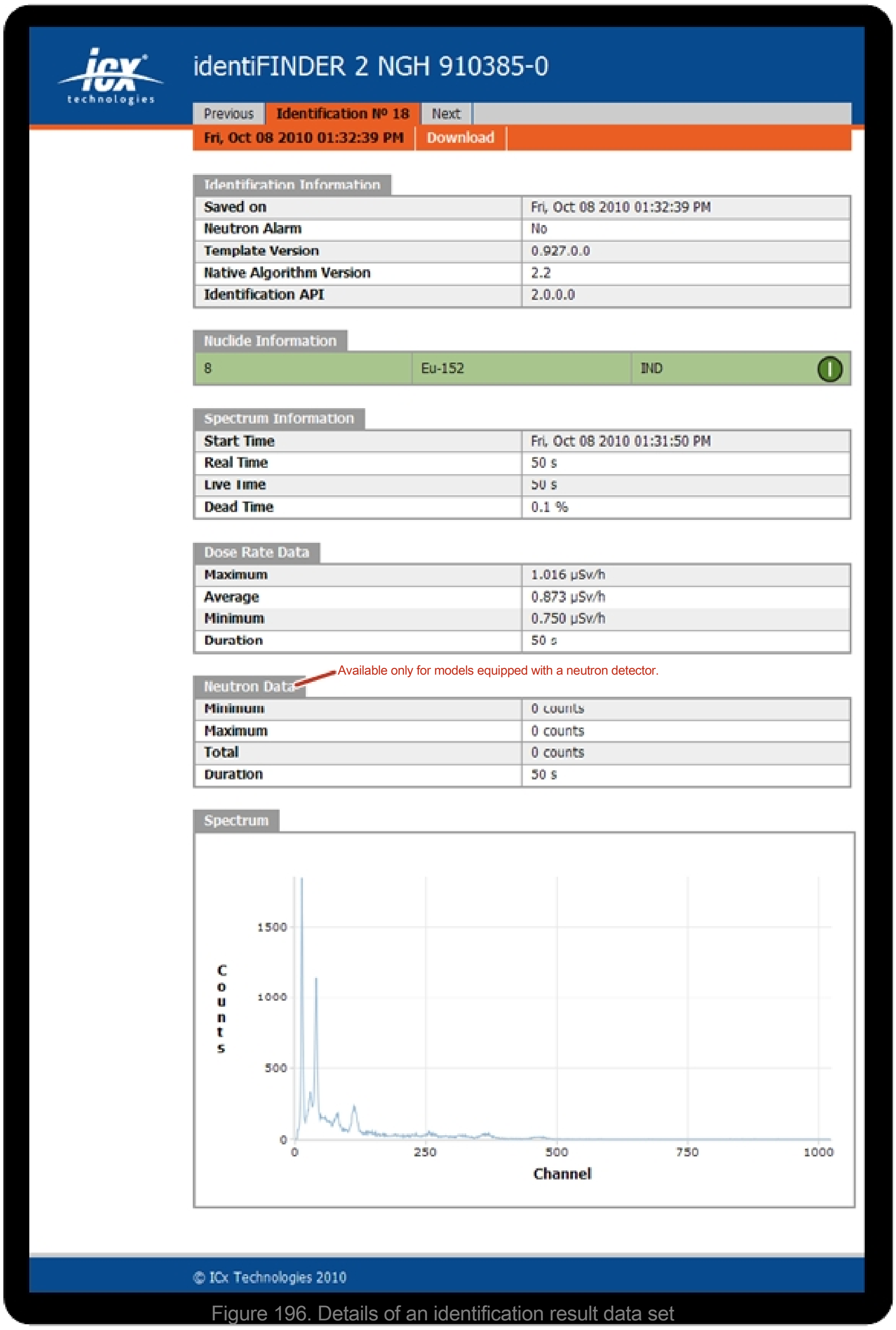
A text file containing instrument information, the identification result and the measured spectrum.

20100915_085311_intrinsic_activity.spc

A text file containing instrument information and the spectrum of the instrument's intrinsic activity.

An intrinsic activity spectrum is available only for instruments with, for example, a built-in calibration source or a $LaBr_3$ detector crystal. It is recorded in a lead shield during the manufacturing process.

You can specify whether *.spc files are included in the downloaded archive (see 4.37, p. 131 or 6.8.3, p. 174).



identiFINDER 2 NGH 910385-0

Previous
Identification № 18
Next
Fri, Oct 08 2010 01:32:39 PM
Download

Identification Information

Saved on	Fri, Oct 08 2010 01:32:39 PM
Neutron Alarm	No
Template Version	0.927.0.0
Native Algorithm Version	2.2
Identification API	2.0.0.0

Nuclide Information

8	Eu-152	IND	Ⓘ

Spectrum Information

Start Time	Fri, Oct 08 2010 01:31:50 PM
Real Time	50 s
Live Time	50 s
Dead Time	0.1 %

Dose Rate Data

Maximum	1.016 µSv/h
Average	0.873 µSv/h
Minimum	0.750 µSv/h
Duration	50 s

Neutron Data

Available only for models equipped with a neutron detector.

Minimum	0 counts
Maximum	0 counts
Total	0 counts
Duration	50 s

Spectrum

1500
1000
500
0
Counts
0
250
500
750
1000
Channel

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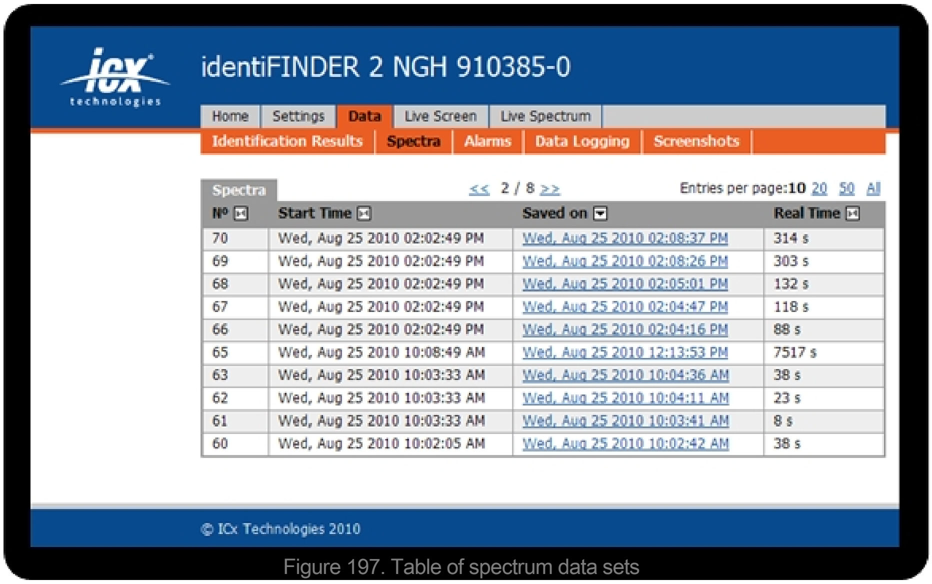
Figure 196. Details of an identification result data set

6.12 SPECTRA (WEB PAGE)

Data (p. 165) ➢ Spectra

This web page (Figure 197, p. 182) tabulates the spectra stored in the ICx identiFINDER 2's database (For the navigation of tables refer to section 6.1.1, p. 161).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Spectra
Alarms
Data Logging
Screenshots
Spectra
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Entries per page:10 20 50 All
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Nº	Start Time	Saved on	Real Time
70	Wed, Aug 25 2010 02:02:49 PM	Wed, Aug 25 2010 02:08:37 PM	314 s
69	Wed, Aug 25 2010 02:02:49 PM	Wed, Aug 25 2010 02:08:26 PM	303 s
68	Wed, Aug 25 2010 02:02:49 PM	Wed, Aug 25 2010 02:05:01 PM	132 s
67	Wed, Aug 25 2010 02:02:49 PM	Wed, Aug 25 2010 02:04:47 PM	118 s
66	Wed, Aug 25 2010 02:02:49 PM	Wed, Aug 25 2010 02:04:16 PM	88 s
65	Wed, Aug 25 2010 10:08:49 AM	Wed, Aug 25 2010 12:13:53 PM	7517 s
63	Wed, Aug 25 2010 10:03:33 AM	Wed, Aug 25 2010 10:04:36 AM	38 s
62	Wed, Aug 25 2010 10:03:33 AM	Wed, Aug 25 2010 10:04:11 AM	23 s
61	Wed, Aug 25 2010 10:03:33 AM	Wed, Aug 25 2010 10:03:41 AM	8 s
60	Wed, Aug 25 2010 10:02:05 AM	Wed, Aug 25 2010 10:02:42 AM	38 s

Figure 197. Table of spectrum data sets

The table shows several columns for every spectrum: Nº

The arbitrary reference number of the data set. Start

Time

The beginning of data acquisition of the spectrum.

Saved on

The date and time of storage of the data set.

You can click this date to open a new web page or browser tab showing details (see 6.12.1, p. 183) of the data set.

Real Time

The real time of data acquisition of the spectrum.

6.12.1 SPECTRUM DETAILS (WEB PAGE)

You can view details for each spectrum data set by clicking the " Saved on" date in the table (Figure 197, p. 182).

The spectrum details are presented as a separate page (Figure 198, p. 184). For the navigation of data sets refer to section 6.1.2, p. 162 .

If the spectrum was saved to the database as the basis of an identification, the first section of the detail page lists this information. Click " Show" to view the detail page of the related identification result (see 6.11.1, p. 180).

To download the shown data set, click Download and follow the directions given by your web browser.

The name of the downloaded *.zip archive will contain the type and number of the data set and the serial number of the ICx identiFINDER 2, for example Spectrum Report 103 (910385- 0).zip.

The downloaded archive contains files named after the saving date and time in several formats:

20100915_085311.n42

An XML file according to ANSI N42.42 2006 containing instrument information, the measured spectrum and the spectrum of the intrinsic activity.

20100915_085311_measurement.spc

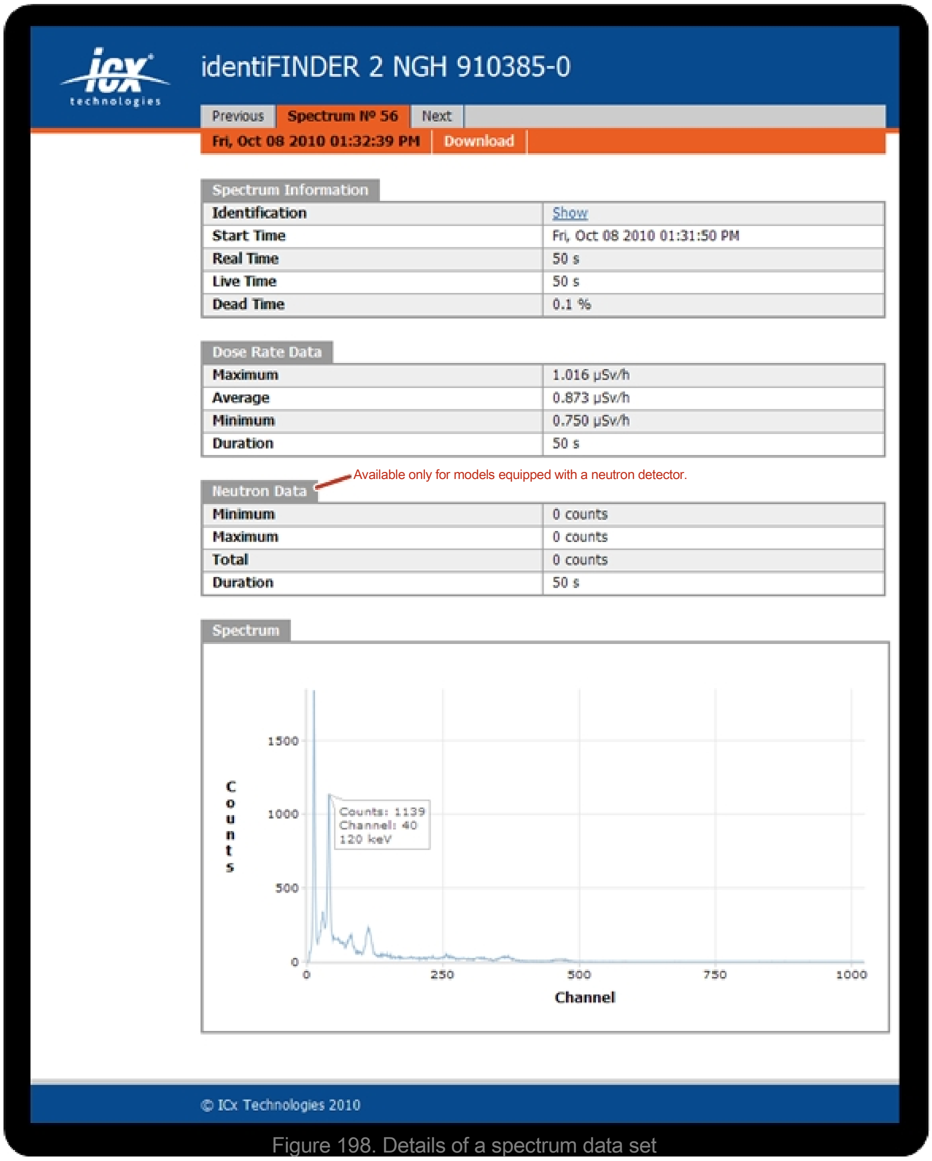
A text file containing instrument information and the measured spectrum.

20100915_085311_intrinsic_activity.spc

A text file containing instrument information and the spectrum of the instrument's intrinsic activity.

An intrinsic activity spectrum is available only for instruments with, for example, a built-in calibration source or a $LaBr_3$ detector crystal. It is recorded in a lead shield during the manufacturing process.

You can specify whether *.spc files are included in the downloaded archive (see 4.37, p. 131 or 6.8.3, p. 174).


icx technologies
Previous
Next
Download

identiFINDER 2 NGH 910385-0

Spectrum Nº 56

Fri, Oct 08 2010 01:32:39 PM

Spectrum Information

Identification	Show
Start Time	Fri, Oct 08 2010 01:31:50 PM
Real Time	50 s
Live Time	50 s
Dead Time	0.1 %

Dose Rate Data

Maximum	1.016 µSv/h
Average	0.873 µSv/h
Minimum	0.750 µSv/h
Duration	50 s

Available only for models equipped with a neutron detector.

Neutron Data

Minimum	0 counts
Maximum	0 counts
Total	0 counts
Duration	50 s

Spectrum

Counts
1500
1000
500
0
0
250
500
750
1000
Channel
Counts: 1139
Channel: 40
120 keV

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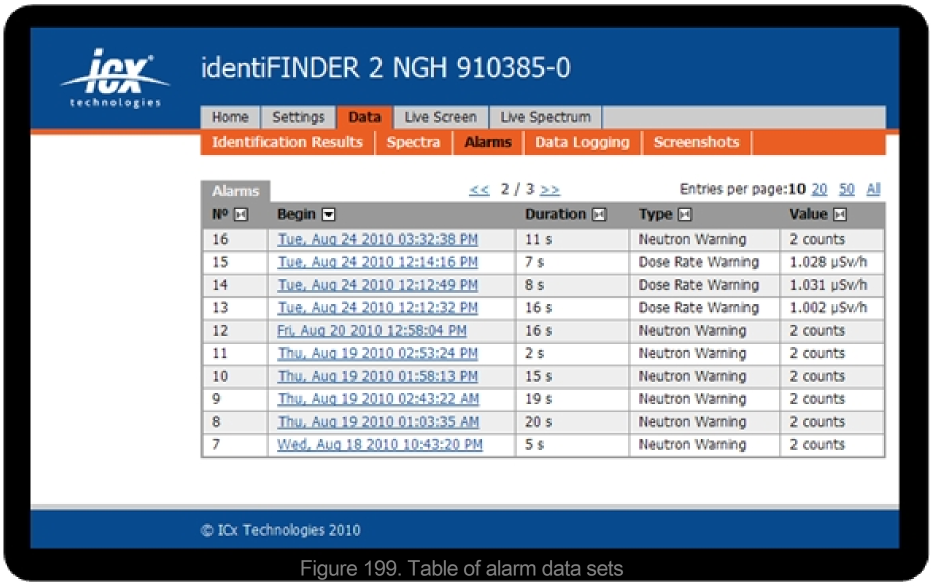
Figure 198. Details of a spectrum data set

6.13 ALARMS (WEB PAGE)

Data (p. 165) ➢ Alarms

This web page (Figure 199, p. 185) tabulates the alarms and warnings stored in the ICx identiFINDER 2’s database (For the navigation of tables refer to section 6.1.1, p. 161).


icx technologies
identiFINDER 2 NGH 910385-0
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Alarms
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Screenshots
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Entries per page:10 20 50 All
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Nº	Begin	Duration	Type	Value
16	Tue, Aug 24 2010 03:32:38 PM	11 s	Neutron Warning	2 counts
15	Tue, Aug 24 2010 12:14:16 PM	7 s	Dose Rate Warning	1.028 µSv/h
14	Tue, Aug 24 2010 12:12:49 PM	8 s	Dose Rate Warning	1.031 µSv/h
13	Tue, Aug 24 2010 12:12:32 PM	16 s	Dose Rate Warning	1.002 µSv/h
12	Fri, Aug 20 2010 12:58:04 PM	16 s	Neutron Warning	2 counts
11	Thu, Aug 19 2010 02:53:24 PM	2 s	Neutron Warning	2 counts
10	Thu, Aug 19 2010 01:58:13 PM	15 s	Neutron Warning	2 counts
9	Thu, Aug 19 2010 02:43:22 AM	19 s	Neutron Warning	2 counts
8	Thu, Aug 19 2010 01:03:35 AM	20 s	Neutron Warning	2 counts
7	Wed, Aug 18 2010 10:43:20 PM	5 s	Neutron Warning	2 counts

Figure 199. Table of alarm data sets

The table shows several columns for every alarm:

Nº The arbitrary reference number of the data set.

Beginning

The date and time the alarm was raised.

You can click this date to open a new web page or browser tab showing details (see 6.13.1, p. 186) of the data set.

Duration

The duration of the alarm. If the instrument was switched off during the alarm, the duration is not given.

Type

The type of alarm or warning.

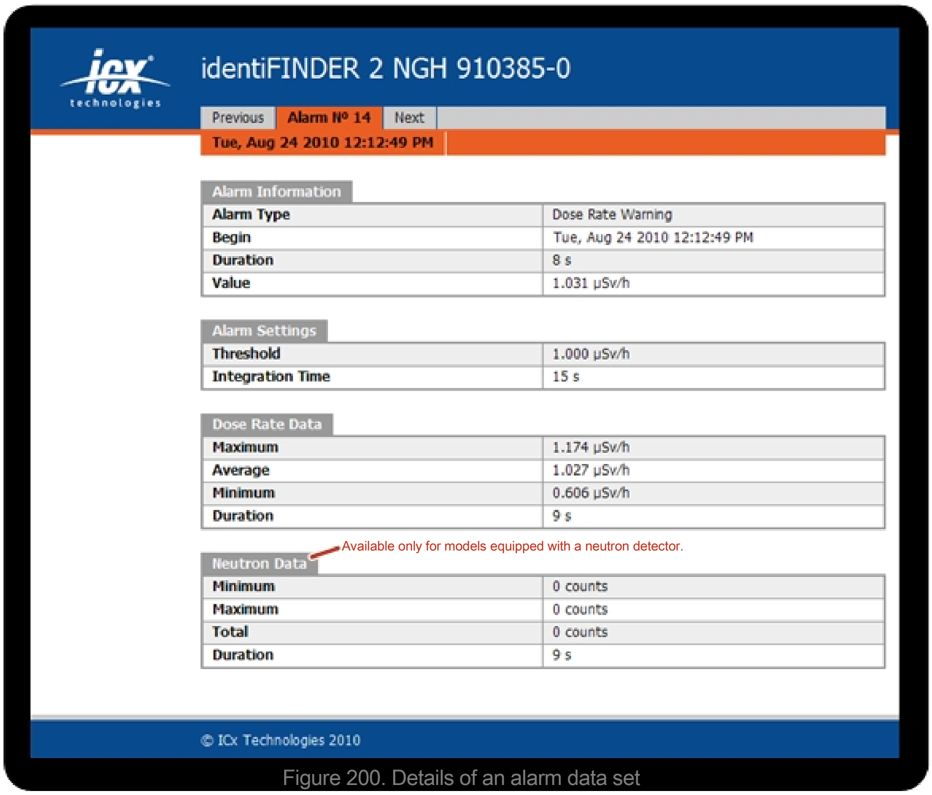
Value

The quantity which increased above the alarm threshold.

6.13.1 ALARM DETAILS (WEB PAGE)

You can view details for each alarm data set by clicking the “ Beginning” date in the table (Figure 199, p. 185).

The alarm details are presented as a separate page (Figure 200, p. 186). For the navigation of data sets refer to section 6.1.2, p. 162 .



identiFINDER 2 NGH 910385-0

Tue, Aug 24 2010 12:12:49 PM

Alarm Information

Alarm Type	Dose Rate Warning
Begin	Tue, Aug 24 2010 12:12:49 PM
Duration	8 s
Value	1.031 µSv/h

Alarm Settings

Threshold	1.000 µSv/h
Integration Time	15 s

Dose Rate Data

Maximum	1.174 µSv/h
Average	1.027 µSv/h
Minimum	0.606 µSv/h
Duration	9 s

Available only for models equipped with a neutron detector.

Neutron Data

Minimum	0 counts
Maximum	0 counts
Total	0 counts
Duration	9 s

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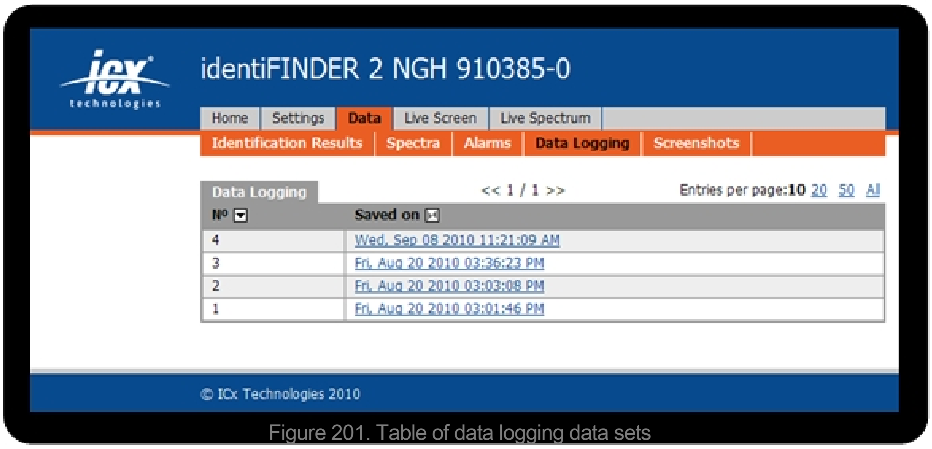
Figure 200. Details of an alarm data set

6.14 DATA LOGGING (WEB PAGE)

Data (p. 165) ➢ Data Logging

Options Menu (p. 69) ➢ More Options (p. 69) ➢ Advanced Options (p. 70) ➢ Data Logging (p. 70) ➢ View Logged Data (p. 115)

This web page (Figure 201, p. 187) tabulates the data sets recorded by the data logger stored in the ICx identiFINDER 2's database (For the navigation of tables refer to section 6.1.1, p. 161).


icx technologies
identiFINDER 2 NGH 910385-0
Home
Settings
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Live Screen
Live Spectrum
Identification Results
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Alarms
Data Logging
Screenshots
Data Logging
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Entries per page:10 20 50 All
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Nº	Saved on
4	Wed, Sep 08 2010 11:21:09 AM
3	Fri, Aug 20 2010 03:36:23 PM
2	Fri, Aug 20 2010 03:03:08 PM
1	Fri, Aug 20 2010 03:01:46 PM

Figure 201. Table of data logging data sets

The table shows several columns for every data logging data set:

Nº	The arbitrary reference number of the data set.
Saved on	The date and time of saving the data logging data set.

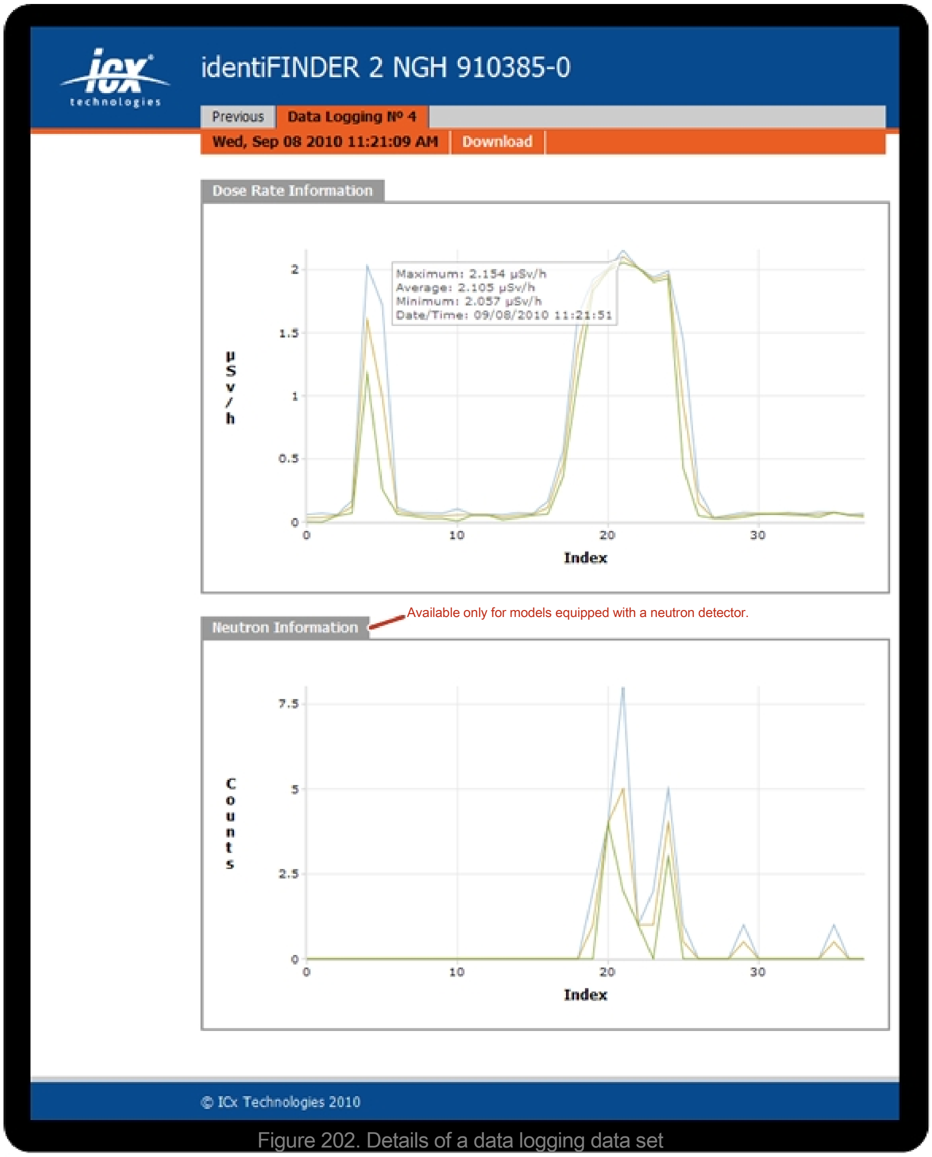
You can click this date to open a new web page or browser tab showing details (see 6.14.1, p. 187) of the data set.

6.14.1 DATA LOGGING DETAILS (WEB PAGE)

You can view details for each data logging data set by clicking the " Saved on" date in the table (Figure 201, p. 187).

The data logging details are presented as a separate page (Figure 202, p. 188).

For the navigation of data sets refer to section 6.1.2, p. 162 .



identiFINDER 2 NGH 910385-0

icx technologies
Previous
Data Logging Nº 4
Download
Dose Rate Information
µSv/h
0
0.5
1
1.5
2
Index
0
10
20
30
Neutron Information
Counts
0
2.5
5
7.5
Index
0
10
20
30

Wed, Sep 08 2010 11:21:09 AM

Maximum: 2.154 µSv/h
Average: 2.105 µSv/h
Minimum: 2.057 µSv/h
Date/Time: 09/08/2010 11:21:51

Available only for models equipped with a neutron detector.

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Figure 202. Details of a data logging data set

The logged data are presented in charts similar to those shown on the instrument (see 4.30, p. 115) with a line representing the minimum, average or maximum value, respectively, per logged period.

Details for a specific position in a chart are shown when you hover the pointer above the chart (Figure 202, p. 188).

To download the shown data set, click Download and follow the directions given by your web browser.

The name of the downloaded *.zip archive will contain the type and number of the data set and the serial number of the ICx identiFINDER 2, for example Datalogging Report 4 (910385-0).zip

The downloaded archive contains the logged data in several formats:

Datalogging Report 4.n42

A file formatted according to ANSI N42.42 2006

Datalogging Report 4.xls

A data table ready to be opened with Microsoft Excel.

⚠ This file is not an ordinary Microsoft Excel file. It has HTML-formatted content but the file name implies Microsoft Excel content. Microsoft Excel can open and process this file but you will receive a message about the content differing from the file type.

■ Opening this file with other spreadsheet software will most probably fail or hide some of the contents without notice.

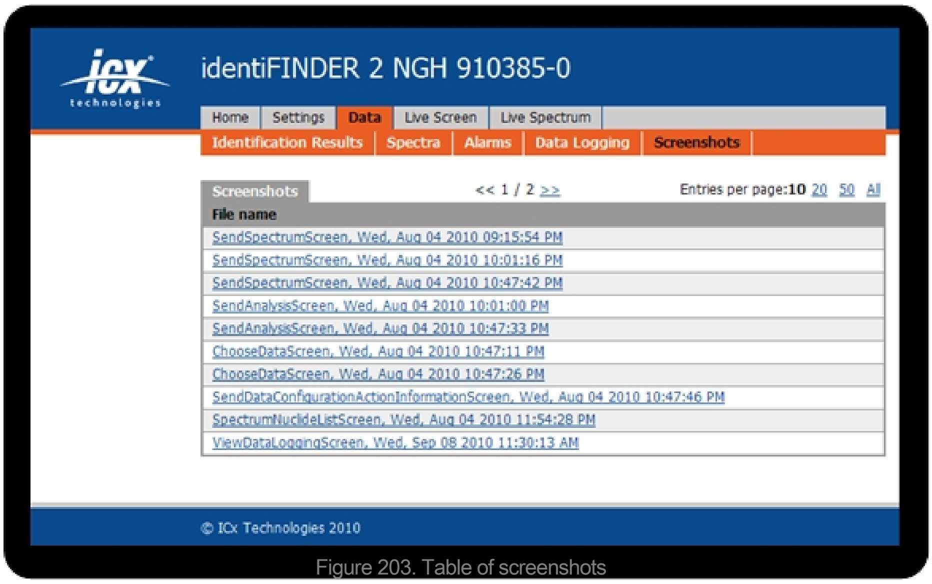
6.15 SCREENSHOTS (WEB PAGE)

Data (p. 165) ➢ Screenshots

This web page (Figure 203, p. 190) lists the screenshots saved in the database of the ICx identiFINDER 2 (see 2.2.6, p. 30, cf 5.2, p. 148).

After you hold the pointer over the name of a screenshot file for a moment, the screenshot will appear in an overlay.

To download a screenshot file to your computer click its name and follow the directions given by your web browser.


identiFINDER 2 NGH 910385-0
Home
Settings
Data
Live Screen
Live Spectrum
Identification Results
Spectra
Alarms
Data Logging
Screenshots
Screenshots
<< 1 / 2 >>
Entries per page:10 20 50 All
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File name
SendSpectrumScreen, Wed, Aug 04 2010 09:15:54 PM
SendSpectrumScreen, Wed, Aug 04 2010 10:01:16 PM
SendSpectrumScreen, Wed, Aug 04 2010 10:47:42 PM
SendAnalysisScreen, Wed, Aug 04 2010 10:01:00 PM
SendAnalysisScreen, Wed, Aug 04 2010 10:47:33 PM
ChooseDataScreen, Wed, Aug 04 2010 10:47:11 PM
ChooseDataScreen, Wed, Aug 04 2010 10:47:26 PM
SendDataConfigurationActionInformationScreen, Wed, Aug 04 2010 10:47:46 PM
SpectrumNuclideListScreen, Wed, Aug 04 2010 11:54:28 PM
ViewDataLoggingScreen, Wed, Sep 08 2010 11:30:13 AM

Figure 203. Table of screenshots

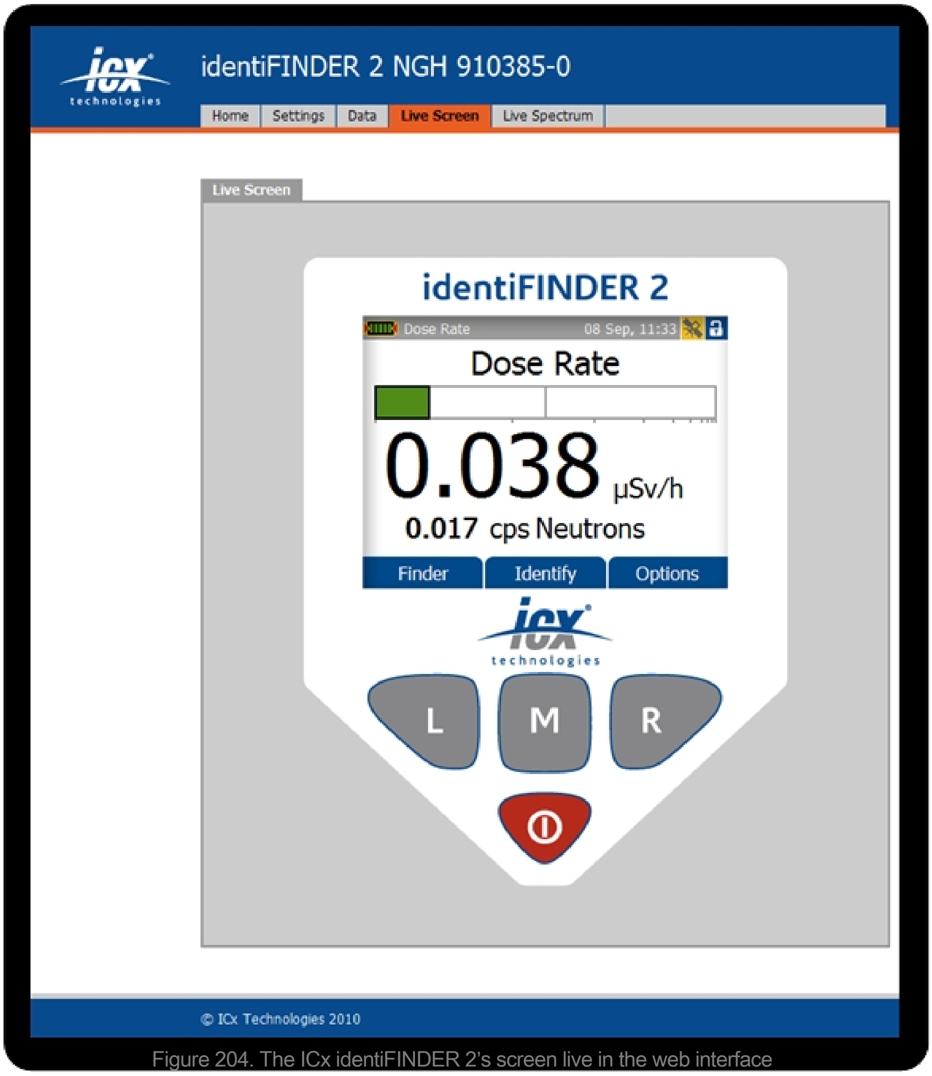
6.16 LIVE SCREEN (WEB PAGE)

Live Screen

This web page reflects the screen of your ICx identiFINDER 2 (Figure 204, p. 191). The image is updated every 2 seconds.

You can operate your ICx identiFINDER 2 with the instrument keyboard (see 2.2, p. 18) or by clicking the buttons in the web page image.

Be patient when clicking or pressing buttons. Your actions are recognized but the image is refreshed only every other second.



identiFINDER 2 NGH 910385-0

Dose Rate 08 Sep, 11:33

Dose Rate

0.038 µSv/h

0.017 cps Neutrons

technologies
Home
Settings
Data
Live Screen
Live Spectrum
Live Screen
identiFINDER 2
Finder
Identify
Options
technologies
L
M
R
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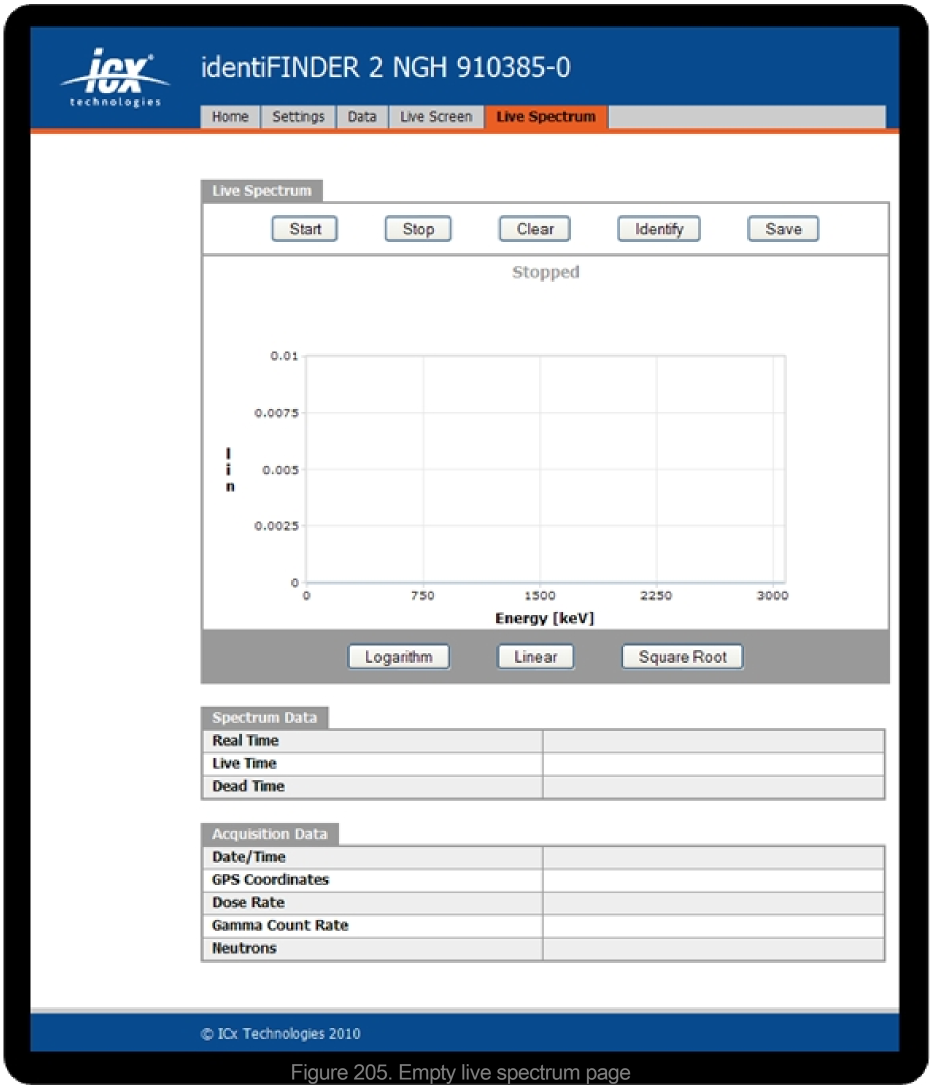
Figure 204. The ICx identiFINDER 2's screen live in the web interface

6.17 LIVE SPECTRUM (WEB PAGE)

Live Spectrum

Options Menu (p. 69) ➢ More Options (p. 69) ➢ Show Spectrum (p. 75)

The main feature of this web page (Figure 205, p. 192) is the live spectrum chart.


icx technologies
identiFINDER 2 NGH 910385-0
Home
Settings
Data
Live Screen
Live Spectrum
Live Spectrum
Start
Stop
Clear
Identify
Save
Stopped
0.01
0.0075
0.005
0.0025
0
lin
0
750
1500
2250
3000
Energy [keV]
Logarithm
Linear
Square Root

Spectrum Data

Real Time	
Live Time	
Dead Time	

Acquisition Data

Date/Time	
GPS Coordinates	
Dose Rate	
Gamma Count Rate	
Neutrons	

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Figure 205. Empty live spectrum page

The live spectrum shown here is independent from the spectrum you can view on the ICx identiFINDER 2 (see 4.7, p. 75).

Buttons above the chart provide commands to acquire and manage spectra, buttons below the chart influence the display of the data.

Start

Starts the acquisition of data.

The spectrum chart and the information shown below the chart are updated every second (Figure 206, p. 194).

The current spectrum is not cleared before recording data, that is, new measurements are added to the existing spectrum. To record a pristine spectrum, use the Clear command first (see below).

The acquisition of spectrum data does not stop if you navigate to another web page or even disconnect the ICx identiFINDER 2 from the computer. The acquisition of spectrum data stops in one of the following events:

- You end the acquisition with Stop.
- You switch off the ICx identiFINDER 2.

We recommend to stop data acquisition before you exit the live spectrum to relieve the ICx identiFINDER 2 from processing spectrum data.

Stop

Stops the acquisition of data.

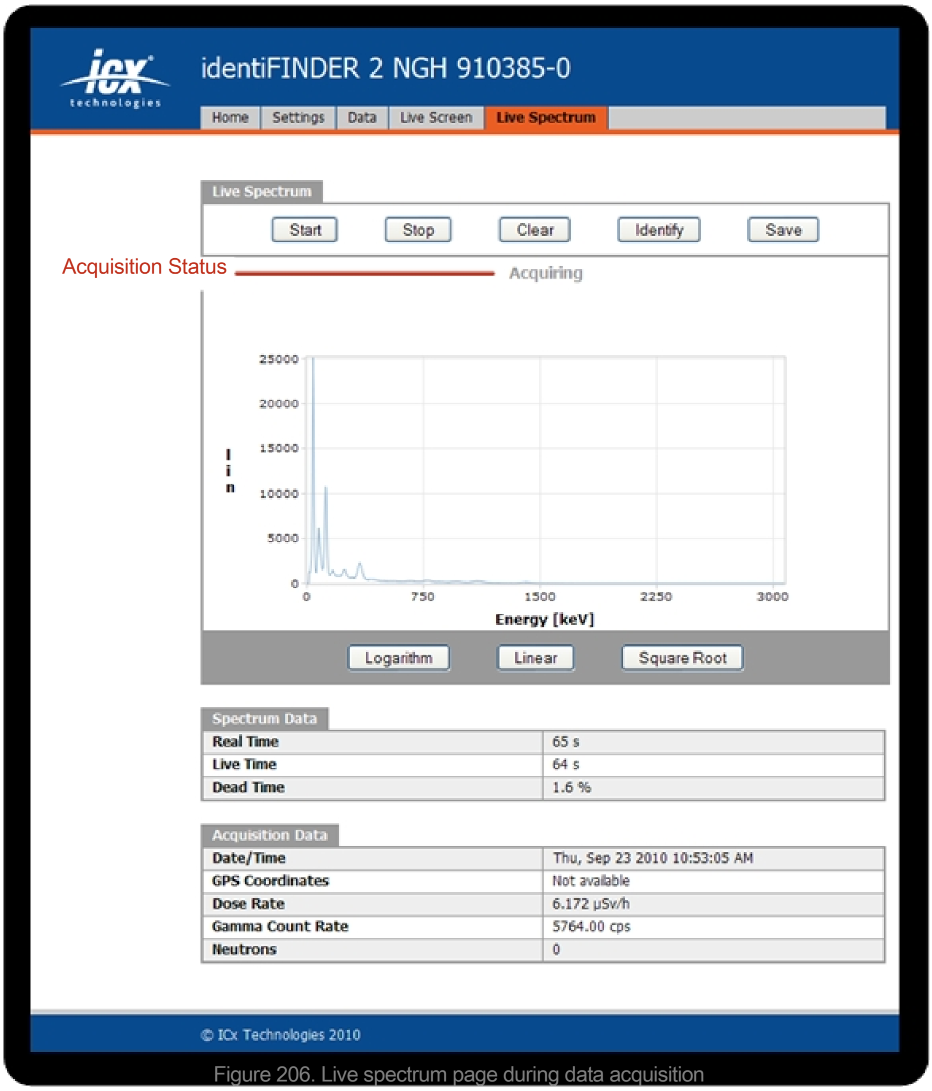
Clear

Clears the spectrum.

This command clears the current spectrum but does not stop the current acquisition of data, if any.

Identifiy

Applies the identification algorithm to the current spectrum. The result is shown above the chart (Figure 207, p. 195).


icx technologies
identiFINDER 2 NGH 910385-0
Home
Settings
Data
Live Screen
Live Spectrum
Live Spectrum
Start
Stop
Clear
Identify
Save
Acquisition Status
Acquiring
lin
25000
20000
15000
10000
5000
0
0
750
1500
2250
3000
Energy [keV]
Logarithm
Linear
Square Root
© ICx Technologies 2010

Spectrum Data

Real Time	65 s
Live Time	64 s
Dead Time	1.6 %

Acquisition Data

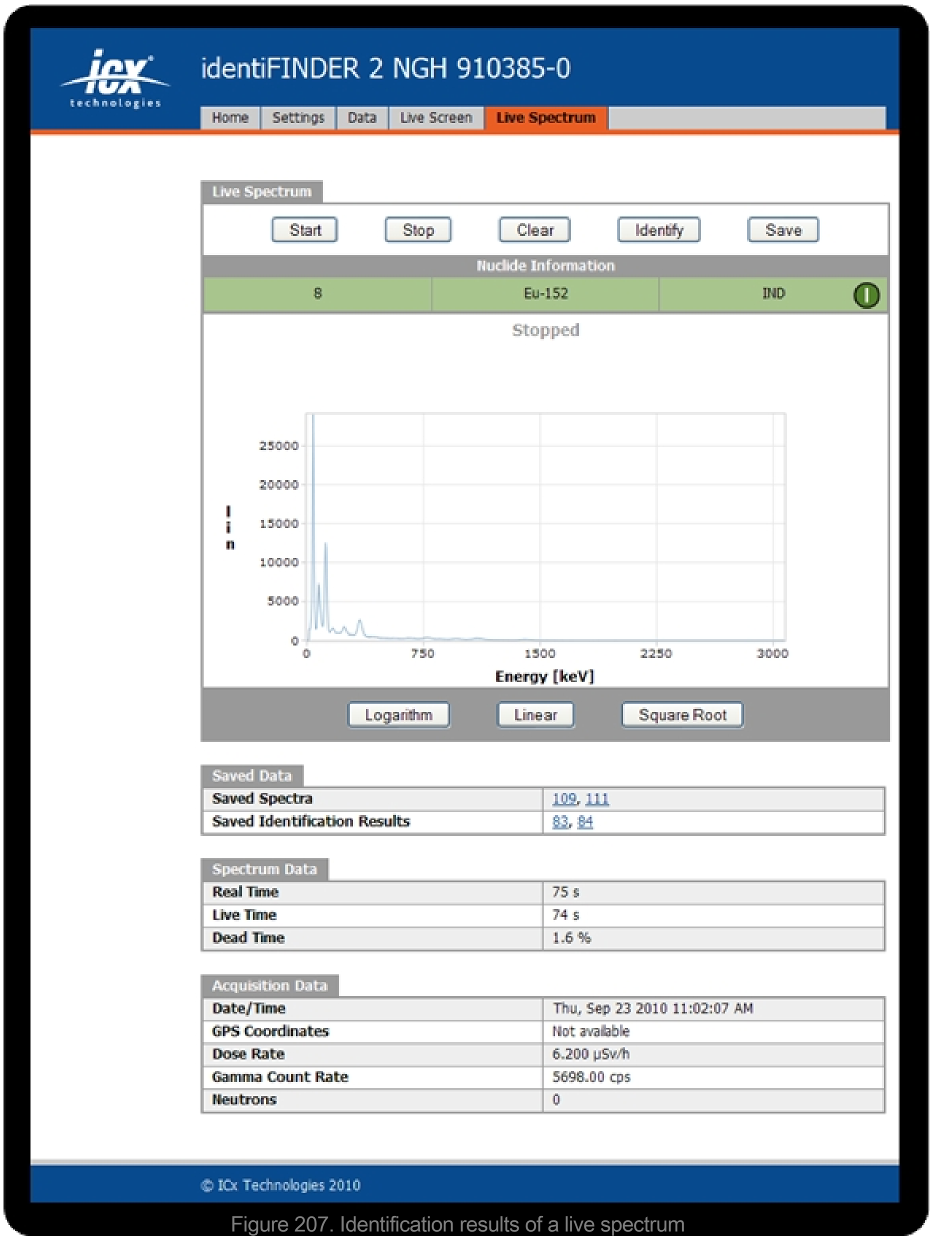
Date/Time	Thu, Sep 23 2010 10:53:05 AM
GPS Coordinates	Not available
Dose Rate	6.172 µSv/h
Gamma Count Rate	5764.00 cps
Neutrons	0

Figure 206. Live spectrum page during data acquisition

The identification result is stored in the ICx identiFINDER 2's database. The reference numbers of identification results saved during this live spectrum session are shown in a section below the chart.

Save

Saves the current spectrum into the database of the ICx


identiFINDER 2 NGH 910385-0
Home
Settings
Data
Live Screen
Live Spectrum
Live Spectrum
Start
Stop
Clear
Identify
Save
Stopped
25000
20000
15000
10000
5000
0
lin
0
750
1500
2250
3000
Energy [keV]
Logarithm
Linear
Square Root
© ICx Technologies 2010

Nuclide Information		
8	Eu-152	IND

Saved Data

Saved Spectra	109, 111
Saved Identification Results	83, 84

Spectrum Data

Real Time	75 s
Live Time	74 s
Dead Time	1.6 %

Acquisition Data

Date/Time	Thu, Sep 23 2010 11:02:07 AM
GPS Coordinates	Not available
Dose Rate	6.200 µSv/h
Gamma Count Rate	5698.00 cps
Neutrons	0

Figure 207. Identification results of a live spectrum

identiFINDER 2. The reference numbers of spectra saved during this live spectrum session are shown in a section below the chart.

Logarithmic

Switches to logarithmic scaling along the vertical axis of the spectrum chart.

Linear

Switches to linear scaling (the default) along the vertical axis of the spectrum chart.

Square Root

Switches to square root scaling along the vertical axis of the spectrum chart.

7 Sending Data to a Remote Server

The ICx identiFINDER 2 can transfer data via the Internet to a remote server for further processing like reachback analysis, archival or whatever process is implemented on the server, see Figure 208, p. 197 for a possible scenario.

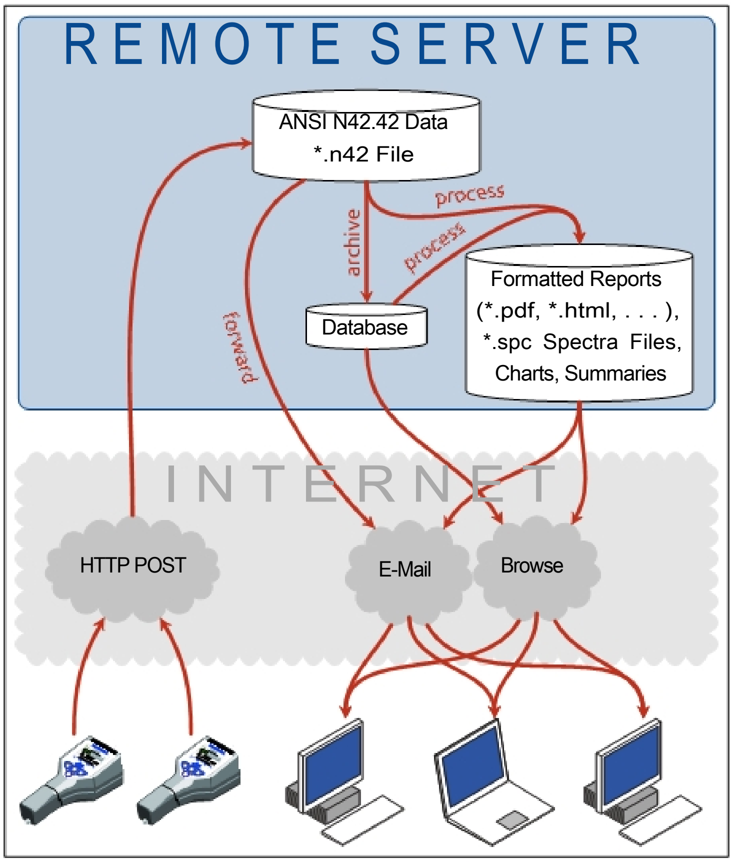

REMOTE SERVER
ANSI N42.42 Data
*.n42 File
process
archive
process
Formatted Reports
(*.pdf, *.html, . . .),
*.spc Spectra Files,
Charts, Summaries
Database
forward
INTERNET
HTTP POST
E-Mail
Browse

Figure 208. A possible scenario for remote handling of ICx identiFINDER 2 data

The ICx identiFINDER 2 uploads data in a file formatted according to ANSI N42.42 2006 via a standard HTTP POST command, so all a server has to do is to process this file. You can develop your own server software (ask us (see A.3, p. 237) for the technical details and a reference example) or have us build server software tailored to your needs.

The connection to the Internet is established by tethering your cell phone to the ICx identiFINDER 2 (Figure 209, p. 198), which is possible if

- your cell phone supports Dial-Up Networking (DUN) via Bluetooth,
- your phone carrier provides the necessary infrastructure and data plan.

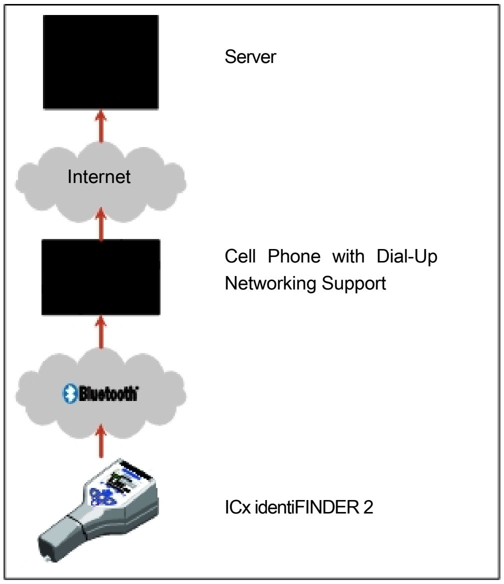

Server
Internet
Cell Phone with Dial-Up Networking Support
Bluetooth
ICx identiFINDER 2

Figure 209. Connection for uploading ICx identiFINDER 2 data to a remote server

To set up the connection you need the correct credentials and access information provided by your cell phone carrier, in particular

User Name

The user name and

Password

the password for the dial up connection. Both can be omitted with some carriers which use other means for authentication, for example your SIM card.

Connection String

Settings specifying the connection, for example

`+CGDCONT=1,"IP","web.example-carrier.com"`.

Phone Number

The number for data connections, for example *99***1#.

Additionally, you need the

HTTP URI

The address of the remote server running the software to accept and handle the data sent by the ICx identiFINDER 2, e.g., http://n42.example.com/reachback.

💡 The protocol (http) is part of the URI, that is, you can change it to https for secure transfer if required.

⚠ https connections require a trusted SSL certificate on the server.

⚠ Protocols other than http or https are not supported.

The ICx identiFINDER 2 will transfer data to this address with a HTTP POST command using these parameters:

`serialnumber`

The serial number of the ICx identiFINDER 2

reachbackfile

The ANSI N42.42-formatted data file

💡 To check the file contents locally, you can download a file with the same contents via the web interface (see 6, p. 159).

➔ To configure your ICx identiFINDER 2 for sending data to a remote server . . .

📝 These steps are required once for a given combination of cell phone carrier and remote server.

1. Collect the required setup information (see above) from your cell phone carrier and your IT administrator.

2. Enter the setup information into the ICx identiFINDER 2 (see 4.34, p. 126)
3. Enter the operator's (your) name and voice phone in the ICx identiFINDER 2 (see 4.37, p. 131) so they can be included in N42.42-formatted reports to be sent.

   Entering these values is much more convenient via the web interface (see 6, p. 159).

➔ To prepare for sending data. . .

These steps are required before actually sending data for the first time after you switch on your ICx identiFINDER 2.

1. Place you cell phone in the vicinity of your ICx identiFINDER 2.
2. Pair your cell phone with the ICx identiFINDER 2 (see 4.33, p. 122).

⚠ All the settings mentioned above are necessary to send data to a remote server. If any item is missing, you will be prompted to enter it when you actually want to send data.

8 Powering the ICx identiFINDER 2

The ICx identiFINDER 2 comes with an installed ICx powerPACK ultra rechargeable battery (see 8.3, p. 204) as the standard power source.

You can power the ICx identiFINDER 2 from an external source (see 8.1, p. 201) or you can use additional ICx powerPACK ultra packages or ICx powerPACK 2 packages (see 8.4, p. 204) to increase the operation time away from external power sources.

8.1 EXTERNAL POWER SOURCES

You can connect the ICx identiFINDER 2 to external power sources via the Micro-USB-B connecter on the rear side (Figure 7, p. 13), for example to a

- wall mounted power supply (included with the ICx identiFINDER 2, Figure 1, p. 6, use the Micro-USB-B to USB-A cable included with the ICx identiFINDER 2, Figure 1, p. 6)
- USB port of a computer (use the Micro-USB-B to USB-A cable included with the ICx identiFINDER 2, Figure 1, p. 6)
- car adapter (sold separately, use the Micro-USB-B to USB-A cable included with the ICx identiFINDER 2, Figure 1, p. 6)

⚠ Please refer to section 5.1, p. 146 for information about plugging and unplugging cables.

The ICx identiFINDER 2 draws a current of approximately 400 mA. Before connecting to a computer, please make sure the USB outlet of the computer complies with this requirement. This might not be the case with some laptops, netbooks or similar battery powered devices.

While the ICx identiFINDER 2 is connected to an external power source, the green LED on the instrument’s rear side is on (Figure 7, p. 13 and Figure 225, p. 212). You can run the instrument from external power and, if a ICx powerPACK ultra is installed, charge the batteries.

8.1.1 WALL MOUNTED POWER SUPPLY

The power supply can handle common international AC voltages and frequencies. It features a swappable adaptor for various international receptacles (Figure 210, p. 202, Figure 211, p. 202)

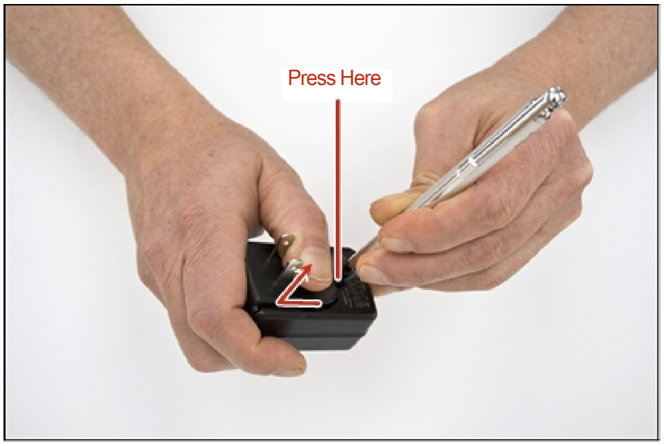


Figure 210. Power Supply: Removing the international adapter

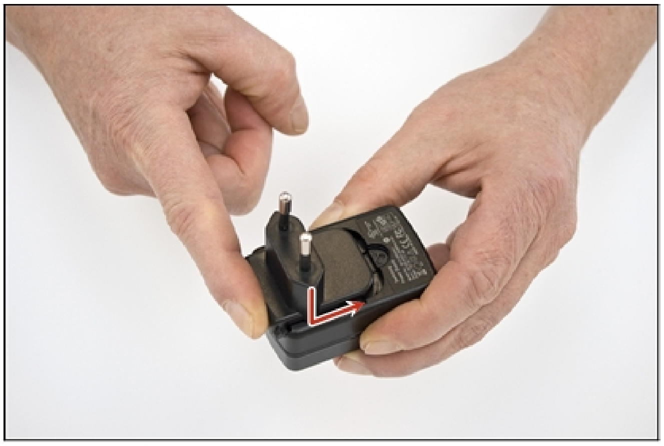


Figure 211. Power Supply: Attaching an international adapter

Compared to a USB power source, charging the ICx powerPACK ultra is a lot faster when you use the power supply of the ICx identiFINDER 2 because it supplies a much higher current as a host conforming to the USB standard.

8.2 HANDLING OF BATTERIES

■ Do not puncture, mutilate, incinerate, disassemble, or heat the batteries above 100 °C (212 °F).

⚠ To avoid damage to the contacts, do not stand battery packs on them.

■ To prevent short-circuits, do not stand battery packs on their contacts on metal tables or other conductive materials. (Figure 212, p. 203).

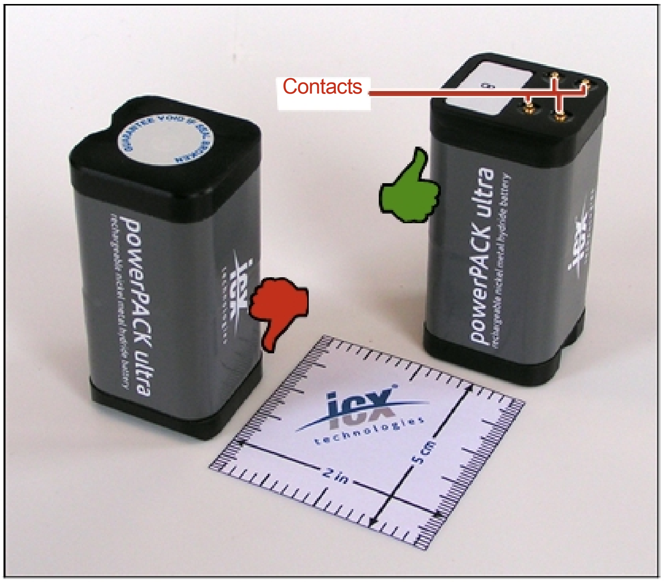

Contacts
powerPACK ultra
rechargeable nickel metal hydride battery
powerPACK ultra
rechargeable nickel metal hydride battery
icx technologies
2 in
5 cm

Figure 212. Never place powerPACKs on contacts

♻ All batteries contain small amounts of heavy metals and other hazardous materials and must be handled and disposed of properly as required in your jurisdiction.

8.3 THE ICx powerPACK ultra

The ICx powerPACK ultra (Figure 213, p. 204) is a sealed pack containing rechargeable low self-discharge nickel-metal hydride batteries (LSD NiMH, also known under various brand names, e.g., “Sanyo Eneloop”). Compared to traditional rechargeable batteries, they feature a higher number of charging cycles, supply a more stable voltage, and a very low self discharge over time.

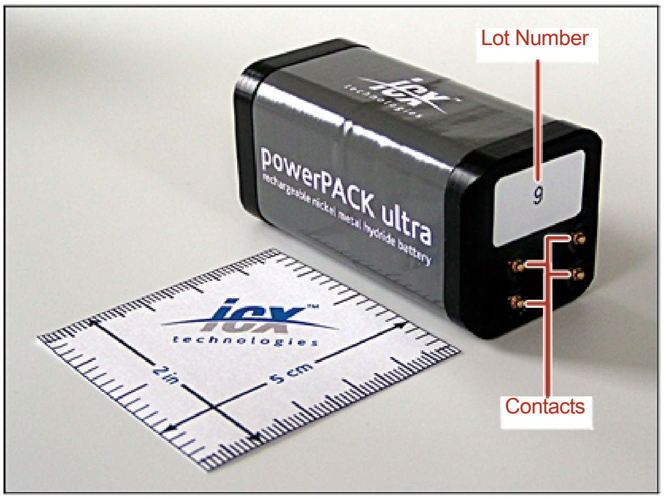

Lot Number
9
powerPACK ultra
rechargeable nickel metal hydride battery
icx technologies
2 in
5 cm
Contacts

Figure 213. The ICx powerPACK ultra

The ICx powerPACK ultra can be recharged within the ICx identiFINDER 2 or in an ICx batteryCHARGER (sold separately, see 10.1, p. 217).

■ Do not open the ICx powerPACK ultra. Breaking the seal voids the warranty.

8.4 THE ICx powerPACK 2

The ICx powerPACK 2 is a container for 4 standard AA batteries. An ICx powerPACK 2 with alkaline batteries is an excellent backup if you need to be ready at a moment’s notice.

■ Do not charge batteries in the ICx powerPACK 2.

⚠ Remove the AA cells if you do not plan on using the instrument for a long period of time.

➔ To install batteries in the ICx powerPACK 2. . .

1. Use a Phillips PH1 screw driver to remove the screw (Figure 214, p. 205).

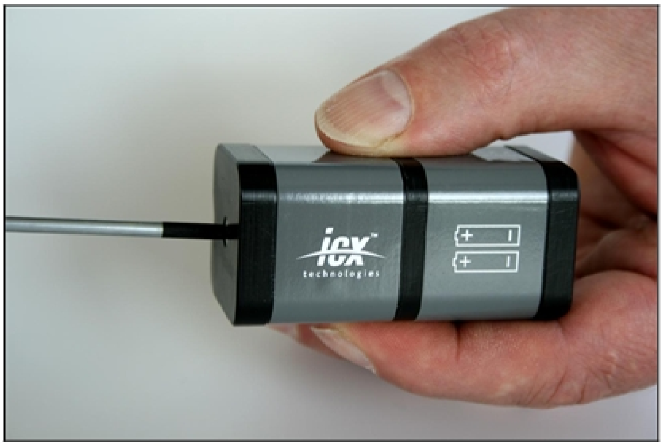

icx
technologies

Figure 214. Filling the ICx powerPACK 2: Opening the pack

2. Separate the halves of the ICx powerPACK 2 (Figure 215, p. 205).

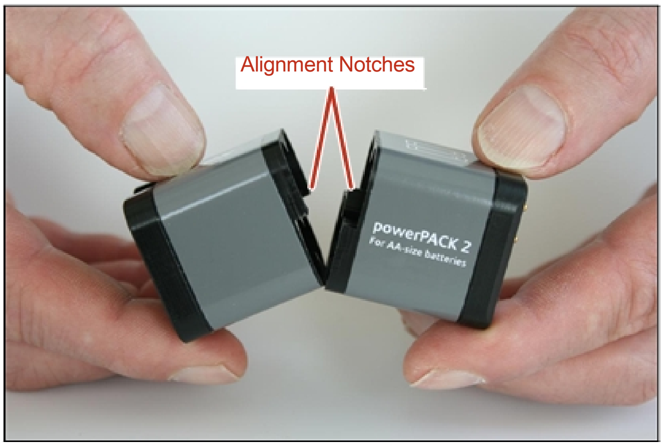

Alignment Notches
powerPACK 2
For AA-size batteries

Figure 215. Filling the ICx powerPACK 2: Separating the halves

3. Hold the half with the contacts in one hand and insert 4 AA-size batteries (Figure 216, p. 206).

   ⚠ Observe the polarity. The correct orientation is shown on the label.

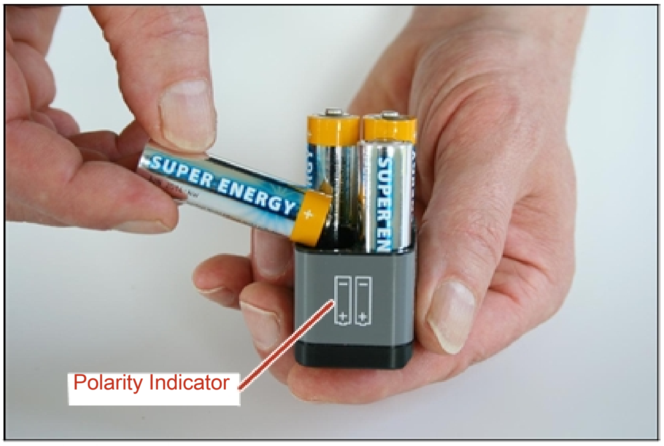


Figure 216. Filling the ICx powerPACK 2: Inserting batteries

4. Slide the other half of the ICx powerPACK 2 over the batteries (Figure 217, p. 207).

   ⚠ Observe the indent to determine the correct orientation.

5. Insert the screw and tighten it (Figure 218, p. 207).

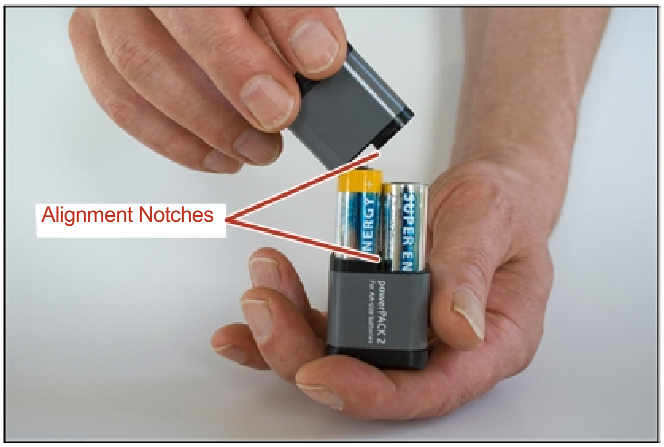

Alignment Notches
ENERGY
SUPER EN
powerPACK 2

Figure 217. Filling the ICx powerPACK 2: Putting on the cover

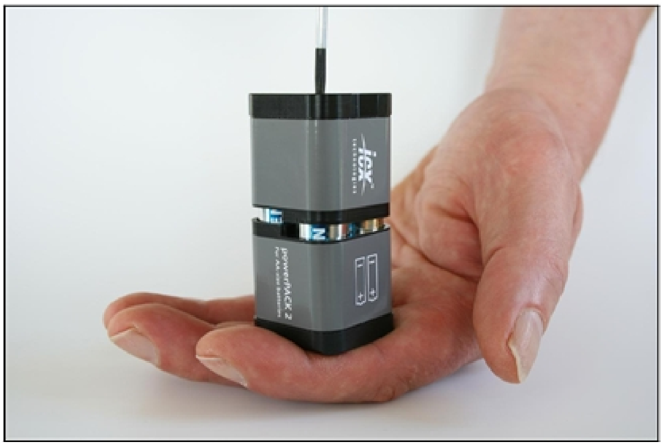

icx
powerPACK 2

Figure 218. Filling the ICx powerPACK 2: Closing the pack

8.5 REPLACING BATTERIES OF THE ICx identiFINDER 2

The battery packs are located in the removable end of the ICx identiFINDER 2’s handle (Figure 6, p. 13).

➔ To unmount a battery pack. . .

1. Loosen the screw at the distal end of the handle (Figure 219, p. 208).

   ⚠ Do not remove the screw completely. Just loosen it until it freely slides in its bearing.

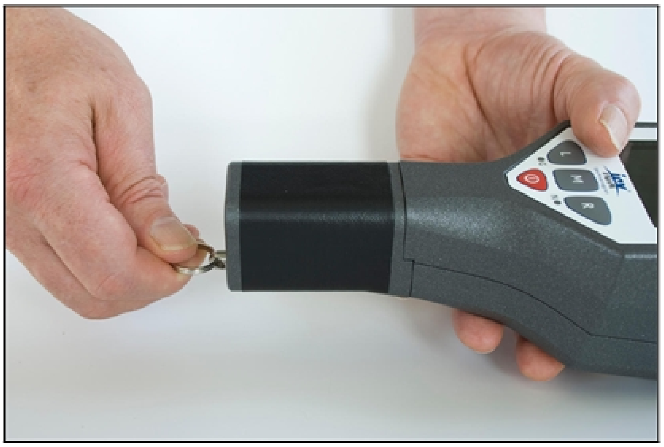


Figure 219. Unmounting the battery pack: Unscrewing the handle

2. Slide the handle towards the back of the instrument until it slips free (Figure 220, p. 209).
3. Remove the battery pack from the handle (Figure 221, p. 209).

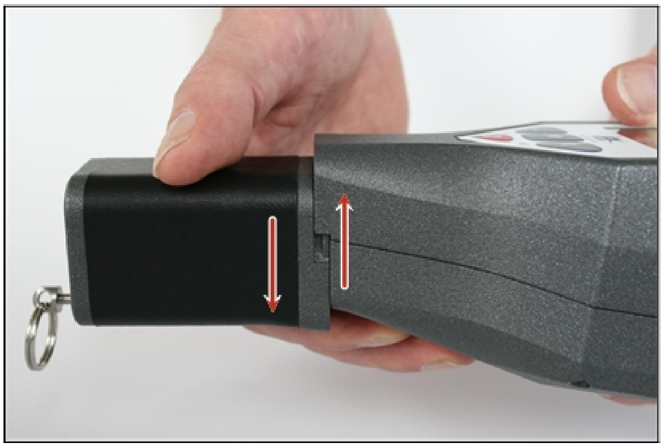


Figure 220. Unmounting the battery pack: Removing the handle from the instrument

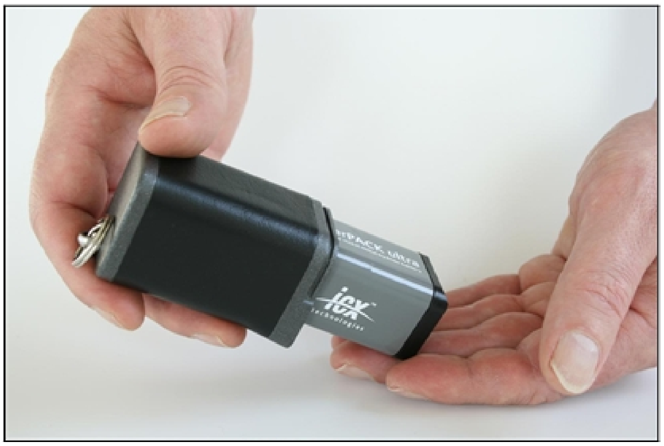


Figure 221. Unmounting the battery pack: Removing the battery pack from the handle

➔ To install a battery pack. . .

1. Insert the battery pack into the handle (Figure 222, p. 210).

   ⚠ Observe the orientation notch to find the correct orientation.

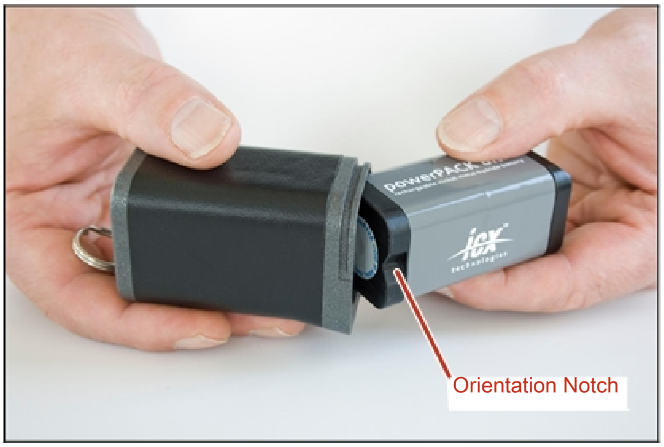


Figure 222. Installing the battery pack: Inserting the pack into the handle

   ■ The top of the battery pack must fall in line with the top of the handle (Figure 223, p. 211). If it sticks out, the orientation is wrong.

2. Align the handle with the groove of the instrument and move it towards the front of the instrument (Figure 224, p. 211).
3. Fasten the screw.

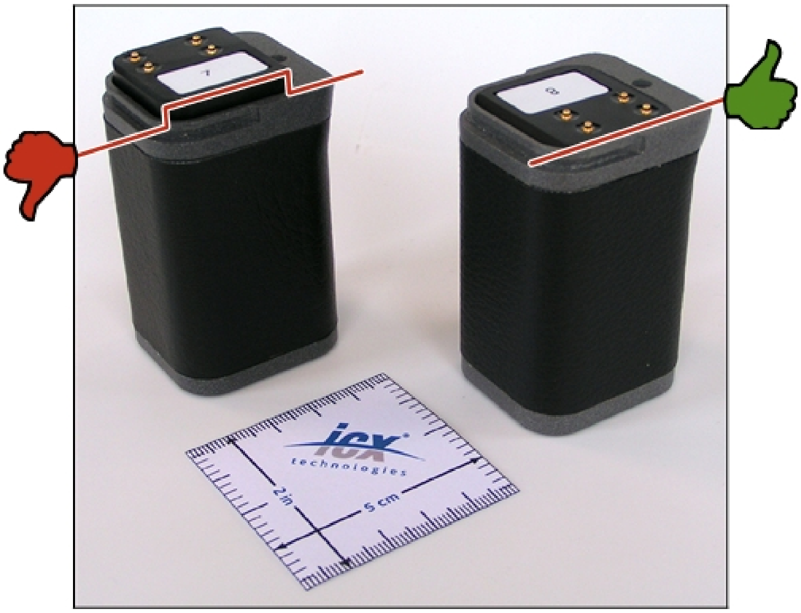


Figure 223. Installing the battery pack: Wrong (left) and correct (right) alignment of battery pack and handle

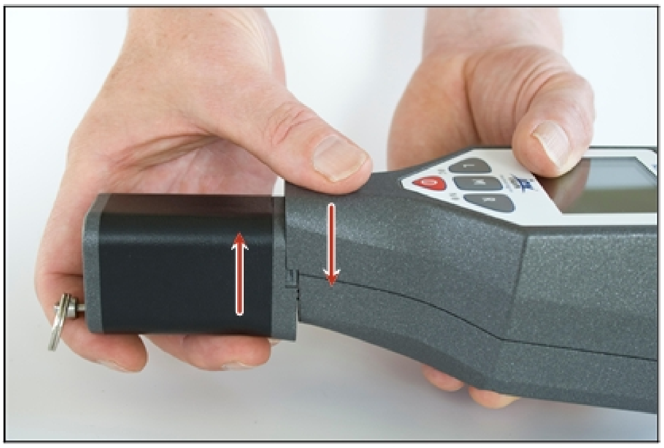


Figure 224. Installing the battery pack: Attaching the handle to the instrument

8.6 CHARGING THE ICx powerPACK ultra

You can charge the ICx powerPACK ultra with the ICx identiFINDER 2 or with an ICx batteryCHARGER (sold separately, see 10.1, p. 217).

Recharge only batteries specifically designed as rechargeable and follow the manufacturer's recommendations on recharging.

➔ To charge batteries in the ICx identiFINDER 2. . .

1. Use the power supply to connect the ICx identiFINDER 2 to a wall outlet or equivalent power source.

or Use the auto adapter to connect the ICx identiFINDER 2 to an appropriate power source.

or Use a USB cable to connect the ICx identiFINDER 2 to a computer or other USB power supply.

Charging is a lot faster when you use the power supply of the ICx identiFINDER 2 because it supplies a much higher current as a host conforming to the USB standard.

2. Observe the power LEDs (Figure 225, p. 212, Figure 7, p. 13).

The green LED indicates the connection to an external power source. The orange LED indicates normal charging. It extinguishes if the battery is full; the instrument then switches to trickle charging to keep the battery at full capacity.

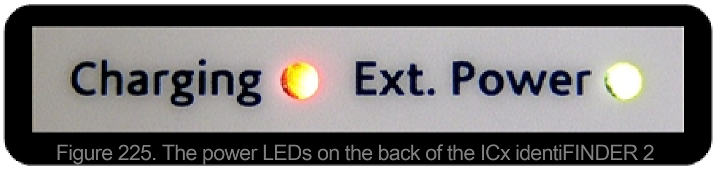


Figure 225. The power LEDs on the back of the ICx identiFINDER 2

or Observe the power indicator if the ICx identiFINDER 2 is running while charging (see 2.1, p. 15).

8.6.1 CHARGING DURATIONS

Shortest charging durations are achieved with

- the ICx identiFINDER 2 switched off and
- the ICx identiFINDER 2 connected to the wall mounted power supply shipped with the ICx identiFINDER 2.

Under these conditions, charging the ICx powerPACK ultra takes about 4 hours.

We recommend leaving the power supply connected for a longer time, for example over night, if circumstances allow.

Charging the batteries will take longer, if

- the ICx identiFINDER 2 switched on, or
- the ICx identiFINDER 2 is powered by a USB-connected computer because the power supply of the ICx identiFINDER 2 supplies a much higher current as a host conforming to the USB standard.

If the batteries are completely discharged, it is recommended to charge them while the ICx identiFINDER 2 is switched off. Wait at least 15 minutes after connecting the power adapter before you switch on the instrument.

When reliable LSD NiMH batteries with higher capacity become available, we will build them into the ICx powerPACK ultra. This will increase the run time and also the charging duration.

9 ICx identiFINDER 2 Maintenance

9.1 FIELD MAINTENANCE

The ICx identiFINDER 2 requires neither field maintenance nor field calibration. Under no circumstances should any part of the housing be penetrated or removed except the handle with the battery pack.

If necessary, clean the instrument with a dry lint-free cloth.

It is recommended that the ICx identiFINDER 2 instrument be returned to the local service organization (see chapter A.3, p. 237) once a year for preventive maintenance and performance optimization.

9.2 CALIBRATION

Due to the advanced internal calibration and stabilization technology of the ICx identiFINDER 2, it is not necessary to routinely calibrate the instrument. You can, however, re-calibrate the ICx identiFINDER 2 as one item on your quality assurance checklist every 6 to 12 months.

Please refer to 4.14, p. 92 for details.

9.3 STORAGE

The ICx identiFINDER 2 should be stored in a dry and clean location. If possible, it should be stored at room temperature.

10 Accessories for the ICx identiFINDER 2

This chapter gives an overview of the various accessories available for the ICx identiFINDER 2; some are included with certain variants, others are sold separately.

10.1 ICx batteryCHARGER

The ICx batteryCHARGER can be used to charge an ICx powerPACK ultra independent from the ICx identiFINDER 2. It is sold as three separate parts (Figure 226, p. 217):

Ⓐ the battery charger box

Ⓑ a wall mounted power supply with international adapters ⓑ C

ⓐ car adapter

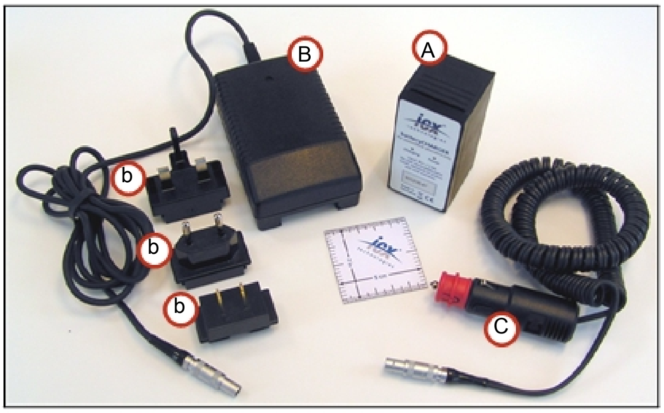


Figure 226. The ICx batteryCHARGER (sold separately) with accessories

➔ To charge batteries in the ICx batteryCHARGER. . .

1. Open the ICx batteryCHARGER by sliding the top lid towards the rear side (Figure 227, p. 218).
2. Insert the ICx powerPACK ultra with the contacts facing down right (Figure 228, p. 218).

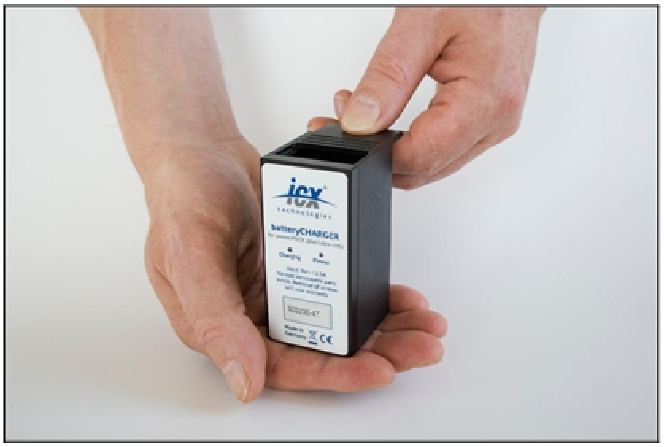


Figure 227. ICx batteryCHARGER: Sliding the lid to open the charger

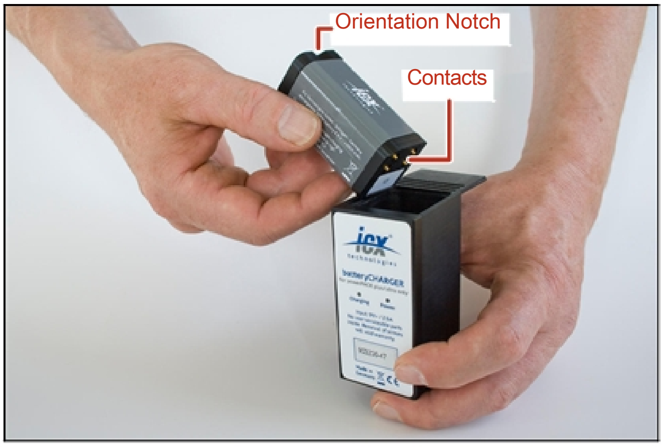


Figure 228. ICx batteryCHARGER: Inserting a ICx powerPACK ultra

3. Verify the correct position of the orientation notch (Figure 229, p. 219).
4. Close the lid by sliding it towards the front.
5. Connect the wall mounted power supply of the ICx batteryCHARGER to the receptacle of on the lower rear side (Figure 230, p. 219).

or Connect the car adapter of the ICx batteryCHARGER to the receptacle of on the lower rear side (Figure 230, p. 219).

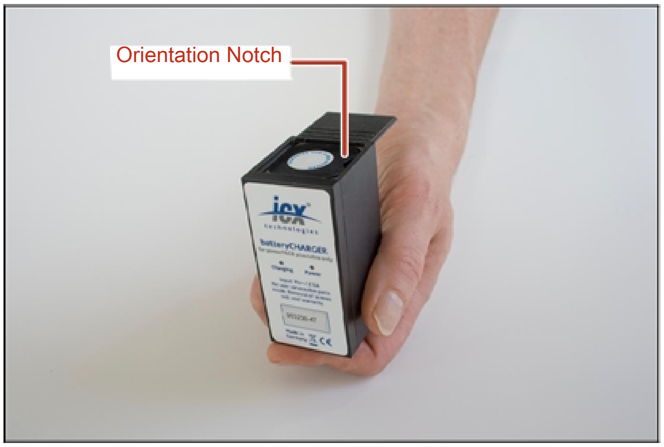


Figure 229. ICx batteryCHARGER: Correct orientation of the ICx powerPACK ultra

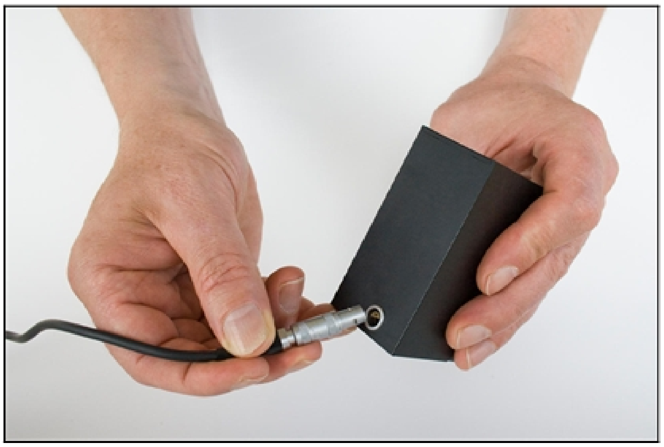


Figure 230. ICx batteryCHARGER: Connecting the power source

6. Observe the power LEDs of the ICx batteryCHARGER (Figure 231, p. 220).

   The green LED indicates the connection to an external power source. The orange LED indicates normal charging. It extinguishes if the battery is full; the ICx batteryCHARGER then switches to trickle charging to keep the battery at full capacity.

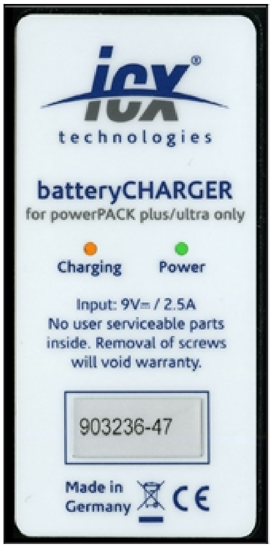

icx
technologies
batteryCHARGER
for powerPACK plus/ultra only
Charging
Power
Input: 9V⎓ / 2.5A
No user serviceable parts inside. Removal of screws will void warranty.
903236-47
Made in Germany
CE

Figure 231. ICx batteryCHARGER: Indicator LEDs

10.2 PE NEUTRON MODERATOR

The Polyethelene Neutron Moderator (Figure 232, p. 221) for the ICx identiFINDER 2 converts fast neutrons into thermal neutrons for which the optional neutron detector of the ICx identiFINDER 2 is sensitive. The PE Neutron Moderator is sold separately for the ICx identiFINDER 2 with a neutron detector.

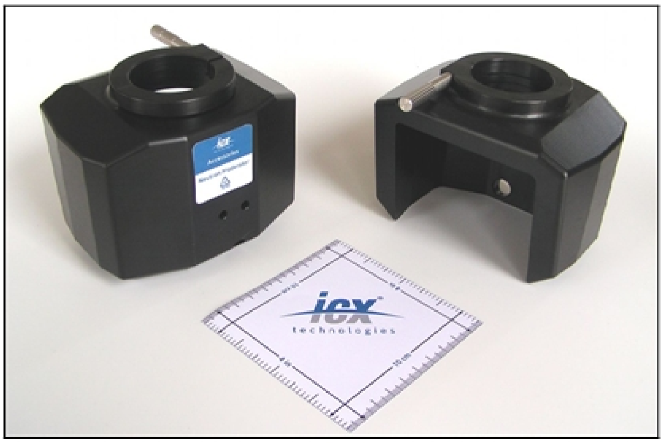


Figure 232. Two PE neutron moderators in rear (left) and front view (right)

The moderator is strongly recommended for neutron detection.

➔ To mount the PE Neutron Moderator . . .

1. Slide the ICx identiFINDER 2 into the neutron moderator as shown in Figure 233, p. 222.
2. Fasten the screw to secure the moderator in its working position (Figure 234, p. 222).

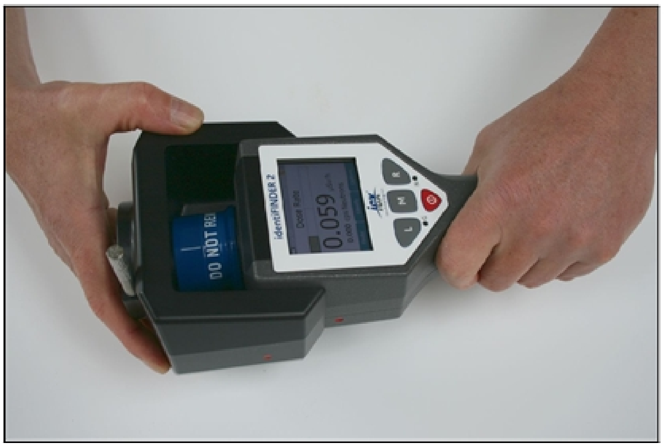


Figure 233. Sliding the ICx identiFINDER 2 into the neutron moderator

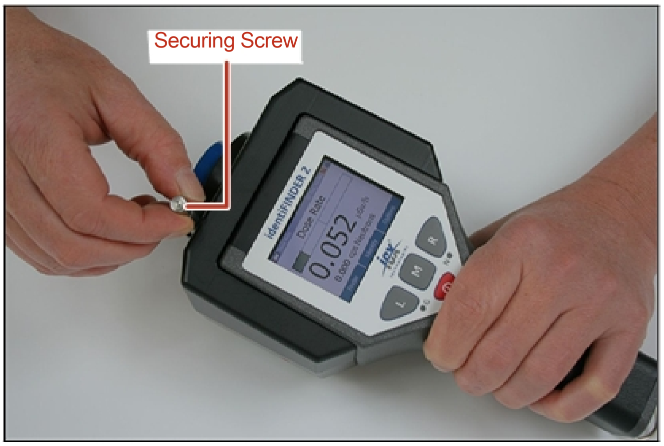


Figure 234. PE Neutron Moderator mounted to the ICx identiFINDER 2

⚠ For tests involving un-moderated neutron sources, a 30 cm × 30 cm × 15 cm PMMA phantom (Figure 235, p. 223) or equivalent must be placed between the source and the detector in the ICx identiFINDER 2 (Figure 242, p. 236) in order to provide adequate moderation of fast neutrons and to simulate field operation instructions in section 3.2.2, p. 41.

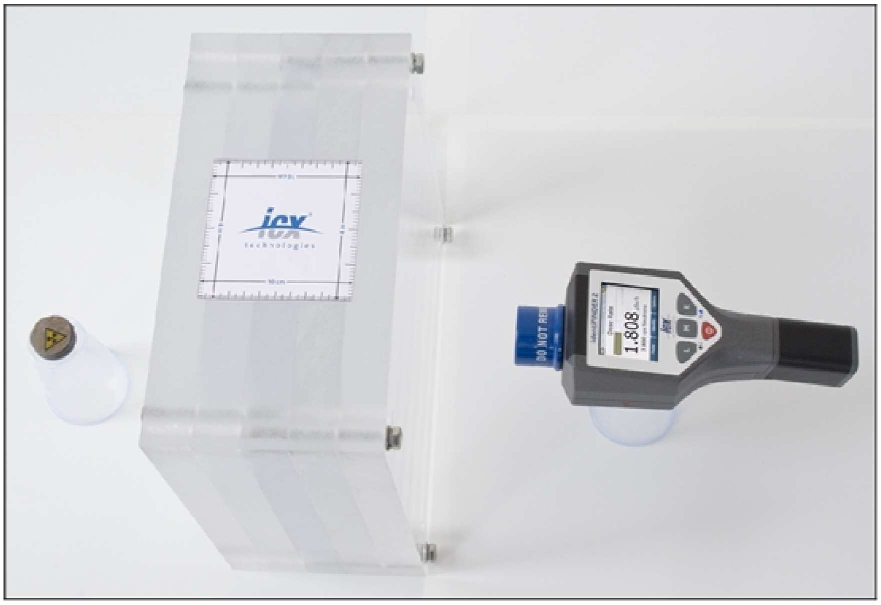


Figure 235. Recommended setup for tests involving fast neutrons

10.3 KCl CALIBRATION BOX

The KCl Calibration Box (Figure 236, p. 224) is included with certain ICx identiFINDER 2 variants having no internal radiation source for calibration purposes (cf. Figure 125, p. 112).

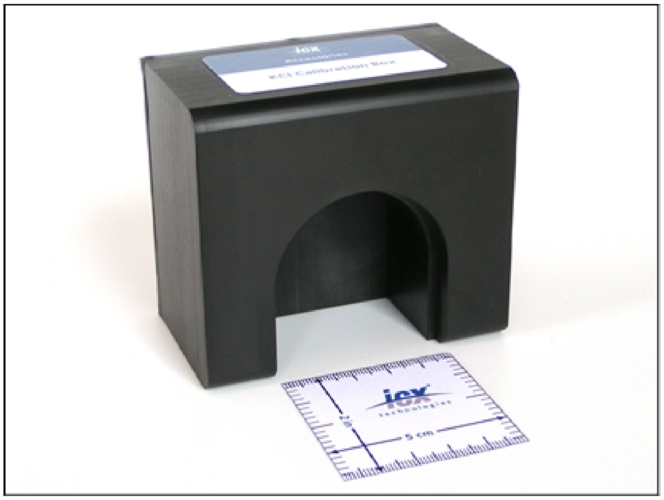

icx
Accessories
KCl Calibration Box
icx technologies
5 cm
5 cm

Figure 236. KCl Calibration Box

10.4 ICx identiFINDER 2 GLOVE

The ICx identiFINDER 2 Glove provides an outside layer of protection for the ICx identiFINDER 2 (Figure 237, p. 225). It is sold as a bundle comprising a sleeve that covers the ICx identiFINDER 2 body and a boot that slides over the detector endcap.

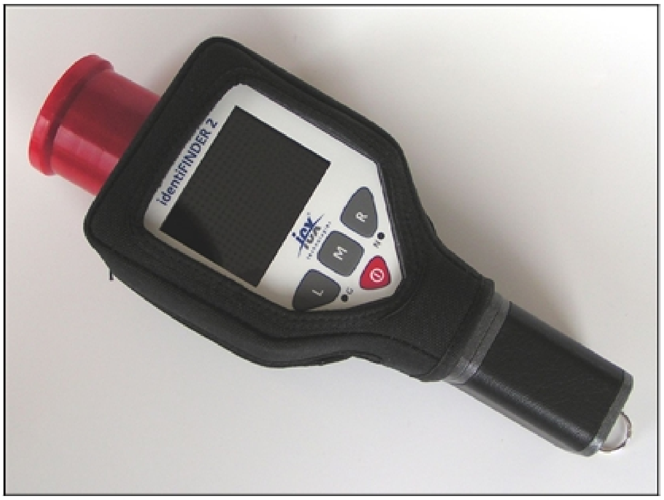


Figure 237. ICx identiFINDER 2 protected by the ICx identiFINDER 2 Glove

The sleeve is manufactured from a moisture resistant synthetic fabric. It slides easily on the ICx identiFINDER 2 (Figure 238, p. 226) and is closed by nylon zippers on both sides (Figure 239, p. 226).

The detector boot (Figure 240, p. 227) is made of soft rubber, molded to provide an extending lip around the top edge of the detector endcap. This ring adds an extra layer of protection for the detector at the most critical spot.

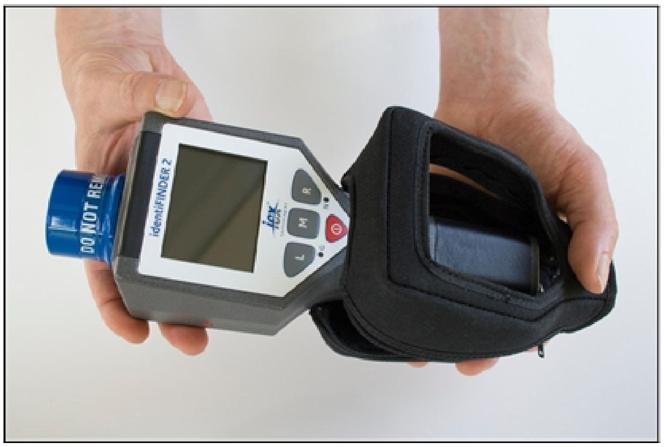


Figure 238. Sliding the ICx identiFINDER 2 into the glove

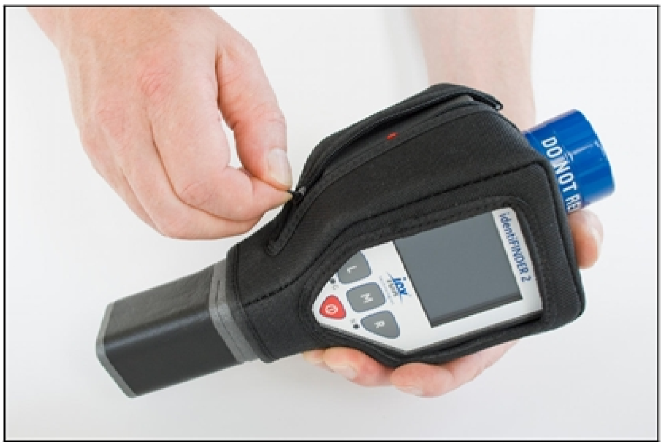


Figure 239. Zipping up the glove

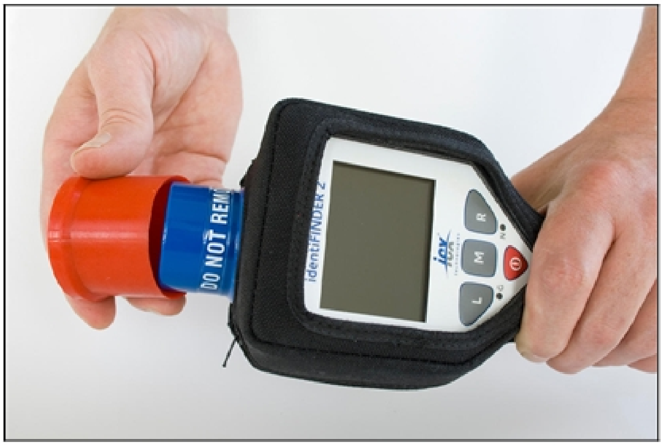

identiFINDER 2
DO NOT REM
R
M
L

Figure 240. Protecting the detector with the rubber boot

10.5 SOURCE SET

The source set (sold separately) is a collection of radiation sources for calibration, testing or training purposes.

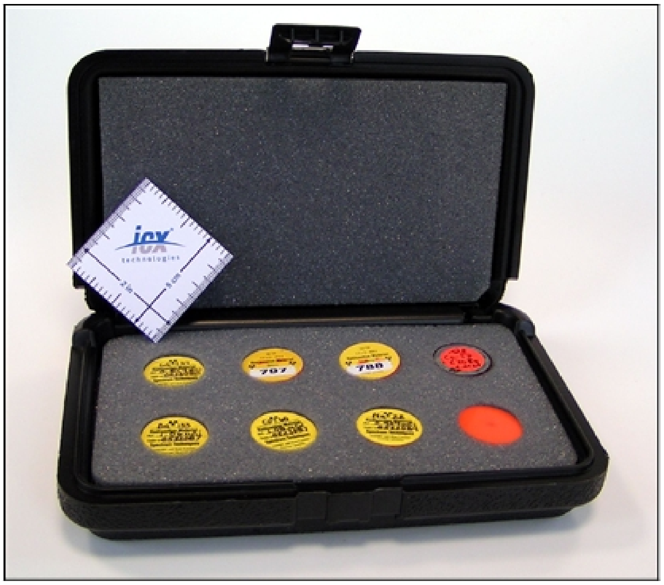


Figure 241. Source set (sold separately)

Source sets are available in the variants shown in the table below, each set comprising 8 plastic disks containing radionuclides bonded as chloride.

	Nuclide	Activity [Bq]	Peaks of Interest [MeV]
RSS8			
1	^{133}B}	37000	0.081 0.276 0.303 0.356 0.384
2	^{152}E€	37000	0.121 0.244 0.344 0.562 0.826 0.963 1.082 1.109 1.408
3	^{137}Cs	37000	0.662
4	^{22}N}	37000	0.511 1.275
5	^{54}Mn	37000	0.835
6	^{57}Co	37000	0.122 0.136
7	^{60}Co	37000	1.173 1.333

to be continued. . .

... continuation

		Nuclide	Activity [Bq]	Peaks of Interest [MeV]				
8	Mix	^{137}Cs	18500	0.662				
		^{65}Zn	37000	0.511	1.115			
RSS8EOD2								
1		^{133}B}	37000	0.081	0.276	0.303	0.356	0.384
2		^{152}E€	37000	0.121	0.244	0.344	0.562	0.826
				0.963	1.082	1.109	1.408	
3		^{137}Cs	9250	0.662				
4		^{22}N}	37000	0.511	1.275			
5		^{54}Mn	37000	0.835				
6		^{57}Co	37000	0.122	0.136			
7		^{60}Co	37000	1.173	1.333			
8		^{109}Cd	37000	0.088				
RSS8EOD3								
1		^{133}B}	37000	0.081	0.276	0.303	0.356	0.384
2		^{152}E€	37000	0.121	0.244	0.344	0.562	0.826
				0.963	1.082	1.109	1.408	
3		^{137}Cs	3700	0.662				
4		^{22}N}	37000	0.511	1.275			
5		^{54}Mn	37000	0.835				
6		^{57}Co	37000	0.122	0.136			
7		^{60}Co	37000	1.173	1.333			
8		^{109}Cd	37000	0.088				
RSS8EOD4								
1		^{133}B}	37000	0.081	0.276	0.303	0.356	0.384
2		^{152}E€	37000	0.121	0.244	0.344	0.562	0.826
				0.963	1.082	1.109	1.408	
3		^{137}Cs	3700	0.662				
4		^{22}N}	37000	0.511	1.275			
5		^{54}Mn	37000	0.835				
6		^{57}Co	37000	0.122	0.136			

to be continued. . .

... continuation

	Nuclide	Activity [Bq]	Peaks of Interest [MeV]				
7	^{60} Co	37000	1.173	1.333			
8	^{109} Cd	37000	0.088				
RSS8EOD5							
1	^{133} B}	37000	0.081	0.276	0.303	0.356	0.384
2	^{152} E€	18500	0.121	0.244	0.344	0.562	0.826
			0.963	1.082	1.109	1.408	
3	^{137} Cs	3700	0.662				
4	^{22} N}	18500	0.511	1.275			
5	^{54} Mn	37000	0.835				
6	^{57} Co	37000	0.122	0.136			
7	^{60} Co	18500	1.173	1.333			
8	^{109} Cd	37000	0.088				

Appendix A: Info Pool

A.1 IDENTIFINDER 2: SPECIFICATIONS

Several variants of this product are available.

Ⓐ identiFINDER 2 NG

NaI detector; GM tube; internal 15 nCi (555 Bq) ^{137}Cs source

Ⓑ identiFINDER 2 NGH

NaI detector; GM tube; ^{3}He tube; internal 15 nCi (555 Bq) ^{137}Cs source

Ⓒ identiFINDER 2 ULCS-NG

NaI detector; GM tube; LED stabilization; internal 3 nCi (111 Bq) ^{137}Cs source

Ⓓ identiFINDER 2 ULCS-NGH

NaI detector; GM tube; ^{3}He tube; LED stabilization; internal 3 nCi (111 Bq) ^{137}Cs source

Ⓔ identiFINDER 2 ULK-NG

NaI detector; GM tube; LED stabilization; external ^{40}K source

Ⓕ identiFINDER 2 ULK-NGH

NaI detector; GM tube; ^{3}He tube; LED stabilization; external ^{40}K source

Ⓖ identiFINDER 2 UL-LG

LaBr detector; GM tube; LED stabilization

Ⓗ identiFINDER 2 UL-LGH

LaBr detector; GM tube; ^{3}He tube; LED stabilization

Specifications relevant for certain variants only are labeled with the variant.

Input/Output	
USB	USB 2.0; micro-B socket
Bluetooth	Class 2.0; ≤ 10 m (32.81 ft) range
Physical	
Dimensions (W × D × H)	248 mm (9.76 in) × 93 mm (3.66 in) × 75 mm (2.95 in)
Weight Ⓑ Ⓓ Ⓕ	1200 g (42.33 oz) including batteries
Weight Ⓐ Ⓒ Ⓔ	1180 g (41.62 oz) including batteries
Housing Material	Aluminium
Environmental	
Operating Temperature	-20 °C - +55 °C (-4 °F - +131 °F)
Storage Temperature	+10 °C - +35 °C (+50 °F - +95 °F)
Relative Humidity	10%- 80 %, non condensing
Shock	According to ANSI N42.34
Protection Rating	IP53 according to IEC 60529
Rapid Temperature Change	Sudden temperature change must not exceed 30.0 °C (54.0 °F) in order to avoid damage to the detector crystal
Performance	
Energy Range (Gamma)	20 keV - 3 MeV
Throughput	>150 kcps
Input Count Rate	300 kcps
Sensitivity (^{137}Cs)	>500 cps per µSv/h
Corrections	Online linearization of gamma spectrum
Gamma Spectrum	1024 channels; 3 MeV
Dose Rate Range	0.000 µSv/h - 10.00 mSv/h
Dose Range	0.000 µSv - 1 Sv
Neutron Sensitivity Ⓑ Ⓓ Ⓕ ◯ Ⓗ	2.6 cps/nv

to be continued. . .

... continuation

Stabilization Ⓒ Ⓓ	Calibration source; LED; ±1 % for temperature change rate of <0.5 °C (0.9 °F)/min
Stabilization Ⓐ Ⓑ	Calibration source; ±1 % for temperature change rate of <0.5 °C (0.9 °F)/min
Stabilization Ⓔ Ⓕ Ⓖ Ⓗ	LED; ±1 % for temperature change rate of <0.5 °C (0.9 °F)/min
Nuclide Identification	According to ANSI N42.34
Typical Resolution Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ	≤ 8 % FWHM at 662 keV at 20.0 °C (36.0 °F) ambient temperature ≤ 4
Typical Resolution Ⓖ Ⓗ	% FWHM at 662 keV at 20.0 °C (36.0 °F) ambient temperature
Battery	
Type	ICx powerPACK ultra (LSD NiMH, rechargeable)
Capacity	2200 mAh; 4.8 V
Operating Duration	≥ 8 h at 20.0 °C (36.0 °F) in dose rate mode with dimmed display back light and GPS switched off
Charging Duration	≤ 4 h at 20.0 °C (36.0 °F) when instrument off and connected to DC power charger and >4 h when powered via USB.
Quiescent Current	16.5 µA typically
Detectors	
Gamma NaI Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ	Crystal size 35 mm (1.38 in) × 51 mm (2.01 in)
Gamma $LaBr_3$ Ⓖ Ⓗ	Crystal size 30 mm (1.18 in) × 30 mm (1.18 in)

to be continued. . .

... continuation

Neutron ^{3}He Proportional Counter Tube Ⓑ Ⓓ Ⓕ Ⓗ	15 mm (0.59 in) × 54 mm (2.13 in); 8 atm (8.106 bar)
Gamma (High Dose Rate)	Geiger-Müller detector
GPS	12-channel SiRF III receiver
Display	
Type	Transflective color LCD
Size	68.4 mm (2.69 in); 320 pixel × 240 pixel
Center Brightness	typ. 400 cd/m^2
Applicable Documents	
ANSI N42.34	Performance Criteria for Hand-Held Intruments for the Detection and Identification of Radionuclides
IEC 60529	Degrees of Protection Provided by Enclosures (IP Code)
UL 61010-1, Part 1	Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use, 2005
EMC - Directive 2004/108/EC	Regulations concerning electromagnetic compatibility
ANSI N42.42 2006	Data format standard for radiation detectors used for Homeland Security
Accessories	
DC Power Adapter, Charger	AC in: 110 V - 230 V; 50 Hz - 60 Hz; DC out: 5 V; 2 A
Carrying Case	Included
Replacement Battery	ICx powerPACK 2 for 4 AA batteries
USB Cable	Micro USB-B to USB-A
Software	
Embedded Software	Windows CE Operating System
Web Interface	TCP/IP emulated via USB

to be continued. . .

... continuation

Reachback	ANSI N42.42 data via Bluetooth to DUN compatible cell phone
STRIDE Data Protocol	STRIDE Data Protocol for network integration
Annunciators	
Neutron Alarm Ⓑ Ⓓ Ⓕ Ⓗ	Blue LED beneath display
Gamma Alarm	Red LED beneath Display
Vibrator	Inside housing
Display	Alarm visualization
Beeper	Inside housing
Charging	Orange LED on rear side
External Power	Green LED on rear side
Memory	
Data Storage Capacity	2 GB internal memory, 1800 MB available for the user
Identifications incl. Spectrum	≈ 600000
Data Logging Every 5 s Ⓐ Ⓒ Ⓔ Ⓖ	≈ 5 years
Data Logging Every 5 s Ⓑ Ⓓ Ⓕ Ⓗ	≈ 2.5 years
Screenshots	≈ 2500
Alarms	≈ 1000000
Calibration	
Internal Source Ⓒ Ⓓ	^{137}Cs; 3 nCi (111 Bq)
Internal Source Ⓐ Ⓑ	^{137}Cs; 15 nCi (555 Bq)
External Source Ⓔ Ⓕ	^{40}K

A.2 DETECTOR POSITIONS

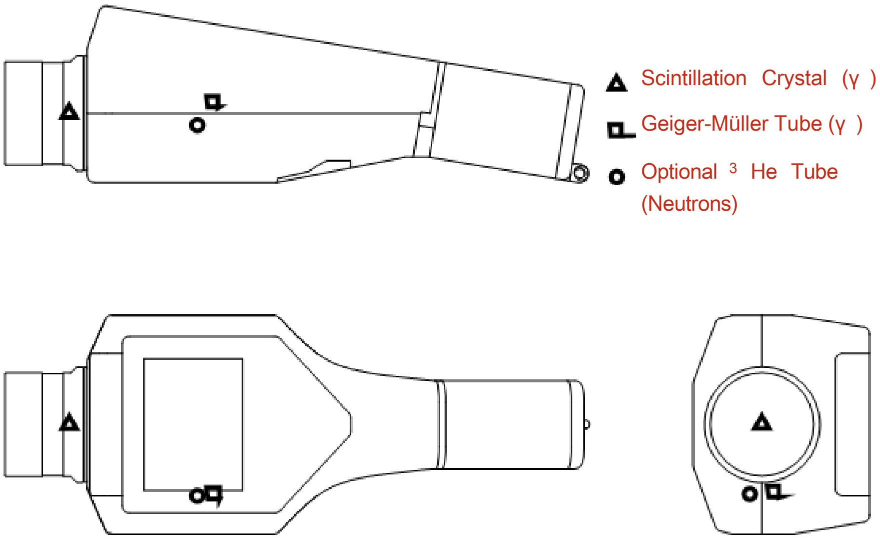

▲ Scintillation Crystal (γ)
▣ Geiger-Müller Tube (γ)
● Optional ^{3}He Tube (Neutrons)

Figure 242. Position of the detector centers of the ICx identiFINDER 2 (drawn to scale).

A.3 AFTER SALES SERVICE AND SUPPORT

Please keep the serial number and the version information (Figure 4, p. 10, Figures 115-116, p. 104-104) ready when contacting our customer support.

ICx Technologies has service centers throughout the world. To locate your local service center please refer to the website (http://radiation.icxt.com). Alternatively, please contact one of our Support Centers:

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Piepersberg 12
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Appendix B: Nuclide Library

The ICx identiFINDER 2 can identify and report some special radiation sources and a number of radionuclides which are listed in the following table.

The usage and severity association given in the table represents the factory defaults. You can adapt the association of nuclides with usage (4.11, p. 88) and severity (4.12, p. 89) to your particular demands.

The table is sorted by element names and lists the following properties of radiation sources.

- Nuclide name in standard notation
- Nuclide name in simplified notation
- Half life
- Severity
  - I Innocent
  - S Suspicious
  - T Threatening
- Usage
  - NORM: Naturally occurring radioactive material
  - MED: Medically used material
  - IND: Industrially used material
  - SNM: Special nuclear material
- Remarks on occurrence or application

ANNH	Annihilation Radiation Ⓘ Industrially used material Annihilation radiation is released by the electron-positron extermination caused by the beta+ decay. It has a fixed energy of 511 keV and is caused by all beta+ radiators. Common examples are ^{18}F (used for medical applications) or ^{22}N} which also emits gamma radiation.
BG	Background Ⓘ Naturally occurring radioactive material The ubiquitous background radiation is emitted from a variety of mostly natural and some artificial sources such as unstable nuclides contained in most chemical elements comprising the lithosphere, biosphere, and atmosphere; cosmic radiation from outer space; and applications of nuclear technology for weapons, power plants and medicine. The background recorded by an instrument is, of course, spoiled by non-natural sources present while measuring the background.
Unk	Unknown ⚠S Unknown nuclear material An unknown source of radiation. Further investigations are necessary.
Americium	
^{241}Am Am(N)	T Special nuclear material Am is one of the materials used to build neutron sources. With Am(N) the identification algorithm reports the possible presence of such an Am-based neutron emitter, based on the analysis of both the Gamma spectrum and the neutron probe.

to be continued. . .

... continuation

^{241}Am Am-241	433 a	T Industrially used material Most commonly used in smoke detectors and to measure levels of toxic lead in paint samples. Also used to ensure uniform thickness in rolling processes like steel and paper production. May be combined with beryllium or lithium to produce a neutron source.
Barium		
^{133}B} Ba-133	10.75 a	I Industrially used material Used in nuclear medicine for patient attenuation correction during an imaging technique (i.e. S.P.E.C.T. imaging) for yielding 3D information of the patient's internal organs, etc.
Bismuth		
^{207}Bi Bi-207	38 a	I Industrially used material Principle use is for research and may be found as a byproduct of proton reactions with lead.
Californium		
^{252}Cf Cf-252	2.645 a	T Special nuclear material Difficult to produce and hence used only for some specialist applications, e.g., monitoring ground water movement, treating cervical or brain cancer. ^{252}Cf is a spontaneous fission source and often used as neutron source.
Cesium		
^{134}Cs Cs-134	2.07 a	I Industrially used material A by-product of the nuclear fission of ^{235}U. Used as a tracer for radiation leaks.

to be continued. . .

... continuation

^{137}Cs Cs-137	30.07 a	I Industrially used material Used as radiotracers to measure and control the liquid flow in oil pipelines and to tell researchers whether oil wells are plugged by sand. Utilized in density and fill height sensors to ensure the correct fill level for food, drugs and other products.
Chromium		
^{51}Cr Cr-51	27 d 17 h	I Industrially used material Used in research in red blood cell survival studies.
Cobalt		
^{57}Co Co-57	272 d	I Industrially used material Included in medical in-vitro diagnostic kits, it is commonly used as a radiological “ marker” to estimate organ size.
^{60}Co Co-60	5.3 a	I Industrially used material Used to sterilize surgical instruments and to improve the safety and reliability of industrial fuel oil burners. Also used in cancer treatment, food irradiation, industrial gauges and radiography.
Europium		
^{152}E€ Eu-152	13.5 a	I Industrially used material Used in nuclear reactor control rods. In some countries this nuclide has been substituted in place of ^{60}Co for radiation therapy.
Gallium		
^{67}G} Ga-67	3 d 6 h	I Medically used material Used to pinpoint infections and tumors. Also used in PET scans for studying the brain and the heart functions.

to be continued. . .

... continuation

Holmium		
^{166m}Ho Ho-166m	1200 a	I Industrially used material Used in physics experiments and research and can also be used in nuclear control rods used in reactors.
Indium		
^{111}In In-111	2 d 19 h	I Medically used material Used for special diagnostic studies, e.g. brain studies, infection and colon transit studies.
Iodine		
^{123}I I-123	13 h	I Medically used material Used to diagnose thyroid function/dysfunction. Also used in PET scans for studying the brain and the heart functions.
^{125}I I-125	60 d	I Medically used material Used in a medical procedure for detecting hormone levels in the blood. Used for cancer treatment of the brain and prostate. It is also used to diagnose deep vein blood clots in the leg, and certain kinds of kidney maladies.
^{131}I I-131	8 d	I Medically used material Used for therapy such as imaging the thyroid and treating its related cancers. Also used to diagnose abnormal liver function, kidney blood flow and urinary tract obstruction.
Iridium		
^{192}Ir Ir-192	74 d	I Industrially used material Temporarily implanted in wire form for use as an internal radiotherapy source in cancer treatment. Also used to test the integrity of pipeline welds, boilers and aircraft parts.

to be continued. . .

... continuation

Manganese		
^{54} Mn Mn-54	312 d	I Industrially used material Used to study and predict the behavior of heavy metal pollutants within the outflow of waste water from mining operations.
Molybdenum		
^{99} Mo Mo-99	2 d 18 h	I Industrially used material Used for generating ^{99m}Tc.
Neptunium		
^{237} Np Np-237	2.14 Ma	T Special nuclear material No major commerical uses except in the production of ^{238} P€.
Plutonium		
^{mix}P€ Pu(N)		T Special nuclear material For certain Pu compositions, a notable neutron emission can be detected. The identification algorithm reports Pu(N), once the Gamma spectroscopic analysis and the state of the neutron probe suggest the presence of such a Pu-based neutron emitter.
^{mix}P€ Rg.Pu	6561 a	Reactors-grade Plutonium T Special nuclear material Plutonium with more than 19 % ^{240} P€
^{mix}P€ Wg.Pu	24100 a	Weapons-grade Plutonium T Special nuclear material Plutonium with less than 7 % ^{240} P€. Used to build most nuclear fission weapons, bombs, and warheads.

to be continued. . .

... continuation

Potassium		
^{40}K K-40	1.277 Ga	Ⓘ Naturally occurring radioactive material There are no specific commercial or medical uses for this isotope of potassium, but it is occurring naturally. Typical concentrations found in food deliver 140-180 µSv/a. Higher ^{40}K concentrations can present a considerable cancer inducing risk.
Radium		
^{226}R} Ra-226	1600 a	Ⓘ Naturally occurring radioactive material A decay product of uranium and thorium, it occurs in virtually all rock, soil, and water in low concentrations. 20 % of the ^{226}R} that is ingested via food and water is deposited into the bone. Although this makes the nuclide dangerous itself, it presents its greatest risk when it decays into ^{222}R}, which is an odorless, tasteless, radioactive gas that can be inhaled into the lungs.
Samarium		
^{153}Sm Sm-153	47 h	Ⓘ Industrially used material Pharmaceutically marketed as “ Quadramet” , it is used for relieving pain caused by secondary cancers within the bone. Also used for treating prostate and breast cancer.
Selenium		
^{75}Se Se-75	120 d	Ⓘ Industrially used material In the form of seleno-methionine this nuclide is used to investigate enzyme production in the digestive tract.

to be continued. . .

... continuation

Sodium		
^{22} N} Na-22	2.6 a	I Industrially used material Used to study the sodium-potassium exchange-dynamic of nerve axons within the nervous systems of living organisms. Also used to locate leaks in industrial pipe lines and in oil well studies.
Technetium		
^{99m}Tc Tc-99m	6 h 1 m	I Medically used material Used for imaging the heart muscle, lungs, brain, and the skeletal system. Other uses include imaging the kidney, liver, thyroid, spleen, gall bladder, salivary and lacrimal glands, and the heart blood pool. It is also used to investigate other medical issues, like certain types of infections. Also used for tracing sewage and liquid waste movements within city infrastructures.
Thallium		
^{201} Tl Tl-201	3 d 1 h	I Medically used material Used for diagnosing coronary artery disease and other heart problems.
Thorium		
^{232} Th Th-232/U-232	14.05 Ga	I Naturally occurring radioactive material Found naturally occurring in abundance within the earth crust, it is not fissile itself, but can be used to generate the fissile element ^{233} U. ^{232} Th is used in gas lantern mantles and WIG welding rods. The spectra of ^{232} Th and ^{232} U are very similar.
Uranium		
^{mix}U DU	4.468 Ga	Depleted uranium (^{235} U < 0.25 %) T Special nuclear material

to be continued. . .

... continuation

^{mix}U HEU		Highly enriched uranium (^{235} U > 20 %) ⬣ Special nuclear material Can be effectively used to manufacture a nuclear fission weapon, and is a primary concern because the design complexity required is far less than that required for a ^{239} P€ based weapon.
^{mix}U LEU	704 Ma	Lightly enriched uranium (^{235} U < 20 %) ⬣ Special nuclear material
^{mix}U U		⬣ Special nuclear material Used as a base material for generating ^{239} P€.
^{232} U U-232/Th-232	68.9 a	⬣ Special nuclear material The spectra of ^{232} Th and ^{232} U are very similar.
^{233} U U-233	160 ka	⬣ Special nuclear material Used in nuclear power generators. Although the United States demonstrated/detonated in 1955 a ^{233} U based bomb core, the use of ^{233} U within a weapon is not as viable of a choice for a weapon when compared to ^{235} U.
Xenon		
^{133} Xe Xe-133	5 d 6 h	● Medically used material ^{133} Xe is used for blood flow measurements and to image the heart, lungs, and brain, for example, by means of tomography.

Appendix C: Glossary

This glossary lists terms, units, and abbreviations used throughout this document and provides a brief explanation. For detailed information consult a textbook or an encyclopedia.

12-Hour Clock

A historic convention in which the 24 hours of the day are split into two halfs called ante meridiem (a.m., “ before mid day”) and post meridiem (p.m., “ after mid day”). Each half comprises 12 hours numbered: 12 (acting as zero), 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, and 11. (see Table 7, p. 273, ↗ 24-Hour Clock)

Table 6. The 12- and 24-hour clock notation.

12-Hour Clock	24-hour Clock
midnight (begin of day) 12:00 a.m.	00:00
12:01 a.m.	00:01
12:59 a.m.	00:59
1:00 a.m.	01:00
2:00 a.m.	02:00
. . .	. . .
11:00 a.m.	11:00
11:59 a.m.	11:59
noon 12:00 p.m.	12:00
12:01 p.m.	12:01
12:59 p.m.	12:59
1:00 p.m.	13:00
2:00 p.m.	14:00
. . .	. . .
11:00 p.m.	23:00
11:59 p.m.	23:59
midnight (end of day)	00:00 (of next day)

24-Hour Clock

The ↗ ISO 8601 convention of time keeping dividing the day running from midnight to midnight into 24 hours. The notation indicates the hours passed since midnight from 0 to 23. (cf ↗ 12-Hour Clock)

Also known as: Army Time, Military Time, Astronomical Time, Radio Time, Railway Time, Continental Time

A ➚ Mass Number

α Particle

➚ Alpha Particle

α Radiation

➚ Alpha Radiation

Absorbed Dose

The amount of energy deposited in matter by ➚ Ionizing Radiation given in ➚ Gray. In contrast to the ➚ Equivalent Dose, the absorbed dose does not differentiate the biological effects of the ionizing radiation.

Acrylic Glass

➚ Polymethyl Methacrylate

Activity

The number of disintegrations of an excited state in a ➚ Nucleus per duration given in ➚ Becquerel.

Adjustment

➚ Calibration

Alarm

An audible, visual, or other signal activated when an instrument reading or response exceeds a preset value or falls outside of a preset range.

Alpha Particle

Two ➚ Protons and two ➚ Neutrons, strongly bound together. It is the ➚ Nucleus of the helium atom $^{4}_{2}\text{He}$. Alpha (α) particles are commonly emitted during the ➚ Decay of heavy ➚ Nuclei.

Also known as: α Particle

Alpha Radiation

A ➚ Particle Radiation of ➚ Alpha Particles. Alpha radiation has a short range in matter, due to its positive charge and heavy mass, being relatively easy to shield, for example by a sheet of paper (Figure 246, p. 268). However, it poses a great health hazard when alpha radiators are ingested by organisms.

Also known as: α Radiation

American National Standards Institute (ANSI)

An organization that oversees the development of voluntary consensus standards for products, services, processes, systems, and personnel in the USA.

ANSI

➚ American National Standards Institute

ANSI N42.42

An ➚ XML-based data format standard for radiation detectors used for homeland security. Sometimes a version is specified with the year of release, for example, ANSI N42.42 2006.

Also known as: N42

Army Time

➚ 24-Hour Clock

Astronomical Time

➚ 24-Hour Clock

Atom

The basic unit of matter consisting of a ➚ Nucleus surrounded by a cloud of ➚ Electrons.

Atomic Mass

The mass of a specific ➚ Isotope, sum of the masses of all ➚ Protons, ➚ Neutrons (➚ Mass Number), and ➚ Electrons.

Atomic Mass Number

➚ Mass Number

Atomic Number (Z)

The number of ➚ Protons in the ➚ Nucleus of an ➚ Atom.

Also known as: Proton Number

β Particle

➚ Beta Particle

β Radiation

➚ Beta Radiation

Background Radiation

The ubiquitous radiation in the environment, emitted from a variety of mostly natural and a few man-made sources. Natural sources are terrestrial (➚ Decay of ➚ Radionuclides like ^{235}U or ^{232}Th abundant in the Earth crust) or cosmic (high-energy ➚ Protons originating primarily from the Sun interact with the upper Earth atmosphere creating a shower of secondary radiation).

Becquerel (Bq)

The becquerel is the ➚ SI derived unit of radioactivity. One Bq is defined as the activity of a quantity of radioactive material in which one nucleus decays per second. (➚ Curie)

$$1\ \mathrm{Bq} = \frac{1}{\mathrm{s}}$$

Beta Particle

High-energy, high-speed ➚ Electrons (β^-) or ➚ Positrons (β^+) emitted as ➚ Beta Radiation. The ➚ Decay of ➚ Neutrons to ➚ Protons emits beta particles and antineutrinos.

Also known as: β Particle

Beta Radiation

A ➚ Particle Radiation of ➚ Beta Particles. Beta Radiation can usually be shielded by a sheet of metal, for example, Al foil (Figure 246, p. 268). Beta radiation ionizes the surface of organisms and can lead to severe burns with long-term sequelae like skin cancer.

Also known as: β Radiation

Bluetooth

A standardized open wireless technology for data communication over short distances using radio waves.

Bq ➚ Becquerel

$(C_2H_4)_n$

➚ Polyethylene

$(C_5O_2H_8)_n$

➚ Polymethyl Methacrylate

Cadmium Zinc Telluride (CZT, CdZnTe)

An alloy of cadmium telluride and zinc telluride, a substance to build ➚ Semiconductor Radiation Detectors usable at room temperature.

Calibration

A defined procedure for the comparison of the reading of an instrument to the value conventionally accepted as correct (a " standard"). In less strict use of the term, calibration is regarded as including the adjustment of the reading of the instrument to agree with the standard, within a specified accuracy.

Also known as: Adjustment

CBRNE

Acronym for chemical, biological, radiological, nuclear, and explosive. It refers to incidents or weapons presenting any of these hazards.

CdZnTe

➚ Cadmium Zinc Telluride

Chemical Element

➚ Element

CONOPS, CONOPs, ConOps

A Concept of Operations is a document describing the characteristics of a system from the viewpoint of an individual user of that system. CONOPS are widely used in the US military or government services.

Continental Time

➚ 24-Hour Clock

Coordinated Universal Time (UTC)

A time standard based on International Atomic Time. Time zones are specified as positive or negative offsets from UTC.

Count

A single detected event registered by a detection system.

Curie

The curie is an older, non-↗ SI unit of radioactivity. (↗ Becquerel)

$$1\ \text{Ci} = 3.7 \times 10^{10}\ \text{Bq};\ 1\ \text{Bq} = 2.70 \times 10^{-11}\ \text{Ci}$$

CZT ↗ Cadmium Zinc Telluride

Dead Time (DT)

The dead time of a detection system is the time after each event during which the system is busy and hence is not able to record another event if it happens. An everyday analogon is the time you have to wait after taking a photo with flash to recharge the flash for the next photo.

Decay

The process by which an unstable ↗ Nuclide (parent) loses energy by emitting ↗ Ionizing Radiation and transforming to another nuclide (daughter). Decay of a single nuclide is spontaneous, that is, it neither needs external triggering nor is it predictable. The average decay rate of a large number of nuclides, however, is predictable and usually given as ↗ Half Life.

Also known as: Disintegration, Radioactive Decay

Deutsches Institut für Normung (DIN)

The German national organization for standardization, represents Germany in the ↗ ISO.

DHS Department of Homeland Security (USA)

Dial-Up Networking (DUN)

A ↗ Bluetooth communications profile to access the Internet or other dial-up services.

DIN ↗ Deutsches Institut für Normung

Dirty Bomb

↗ Radiological Dispersion Device

Disintegration

➚ Decay

DNDO

Domestic Nuclear Detection Office of the ➚ DHS (USA)

Dose

A measure of the ➚ Ionizing Radiation energy transfer to, for example, tissue (➚ Sievert).

Dose Rate

The quotient of ➚ Dose given in ➚ Sievert and time.

DT ➚ Dead Time

DUN

➚ Dial-Up Networking

Electromagnetic Radiation

Self-propagating waves comprising electric and magnetic field components. The ➚ Spectrum ranges from low-frequent radio waves (longer waves), microwaves, visible light, ultraviolet radiation, X-rays up to high-frequent ➚ Gamma Radiation (shorter waves).

Electron

A subatomic particle with a negative electric charge, counterpart of the ➚ Positron. It is emitted as ➚ Beta Radiation.

Electron Volt (eV)

The electron volt is a non-➚ SI unit of energy (➚ Joule) employed in radiation physics. It is equal to the amount of kinetic energy gained by a single unbound electron when it accelerates through an electrostatic potential difference of one volt.

$$1\ \text{eV} \approx 1.602177 \times 10^{-19}\ \text{J}$$

Element

Pure substance consisting of ➚ Nuclides having the same number of ➚ Protons (also known as ➚ Atomic Number) sharing the same chemical properties. The nuclear properties differ if the number of ➚ Neutrons varies in the nuclides (➚ Isotope).

Also known as: Chemical Element

Equivalent Dose

A measure of the radiation ➚ Dose absorbed by tissue where an attempt has been made to consider the different relative biological effects of different types of ➚ Ionizing Radiation.

The equivalent dose is calculated by weighting the ➚ Absorbed Dose with a factor selected for the type and energy of the radiation. The weighting factor ranges from 1 for ➚ Gamma Radiation and ➚ Beta Radiation to higher values for ➚ Alpha Radiation, ➚ Protons, and ➚ Neutrons.

eV ➚ Electron Volt

Extensible Markup Language

➚ XML

False Alarm

An ➚ Alarm not caused by a radioactive source under the specified background conditions.

False Alarm Rate (FAR)

The number of ➚ False Alarm per duration.

FAR ➚ False Alarm Rate

Fast Neutron

➚ Neutron Temperature

FGPu

➚ Fuel-Grade Plutonium

Fission

An exothermic nuclear process in which a ➚ Nucleus is usually absorbing a ➚ Neutron and two fission fragments and a few fission neutrons emerge.

Also known as: Nuclear Fission

Fuel-Grade Plutonium (FGPu)

A mixture of ^{239} P€, ^{240} P€ and other ➚ Isotopes, which contains between 7% and 19% ^{240} P€.

Full Width at Half Maximum (FWHM)

The full width at half maximum height of a ➚ Peak in a ➚ Spectrum (Figure 243, p. 257).

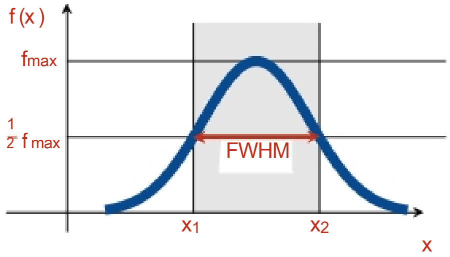

Figure 243. Full width at half maximum height of a peak

Fusion

An exothermic nuclear process in which two or more light ➚ Nuclei are confined together forming a heavier nucleus. The magnetic confinement is usually realized in plasma devices as e.g. a Tokamak or a Stellarator. A Tokamak is a toroidal chamber surrounded by magnetic coils. It can be seen as a huge current transformator, which produces enough potential to ignite a plasma inside the chamber. Contrary to the symmetric appearance of a Tokamak, a Stellarator has a non-symmetric, highly complex field and chamber desing.

Also known as: Nuclear Fusion

FWHM

➚ Full Width at Half Maximum

γ Radiation

➚ Gamma Radiation

Gamma Radiation

Gamma (γ) radiation is energetic (typically >100 keV) ➚ Electromagnetic Radiation of high frequency (typically $>10^{19}$ Hz) and very short wavelength (typically $<10^{-11}$ m).

Gamma radiation originating from ➚ Decay typically carries energies from a few hundred keV to about 10 MeV and is ➚ Ionizing Radiation.

Gamma radiation penetrates deeply and is difficult to stop. It can be stopped by a sufficiently thick layer of material with high ➚ Atomic Number, such as $_{82}$Pb (lead, Figure 246, p. 268).

Also known as: γ Radiation

Gamma Ray Detection

Gamma rays can be detected by observing their interaction with matter. Some materials emit visible light when hit by gamma rays (➚ Scintillator), some gases are ionized and conduct electricity (➚ Geiger-Müller Tube), or some semiconductors (➚ Semiconductor Radiation Detector) change electric conductivity when exposed to gamma radiation.

Ge ➚ Germanium

Geiger-Müller Tube (GM Tube)

A device to detect ➚ Ionizing Radiation consisting of a tube filled with low-pressure noble and halogene gas in a strong electric field. Incident radiation produces ➚ Ions which can be measured as electric current between the electrodes.

Germanium (Ge)

A substance used in high-precision ➚ Semiconductor Radiation Detectors for ➚ Gamma Radiation.

Global Positioning System (GPS)

A constellation of satellites sending microwave signals which enable receivers to determine the time, their location, speed, and direction. Also known as: Navstar Global Positioning System

GM Tube

➚ Geiger-Müller Tube

GMT

➚ Greenwich Mean Time

GPS ➚ Global Positioning System

Gray (Gy)

The gray is the ➚ SI derived unit of ➚ Absorbed Dose due to ➚ Ionizing

Radiation. One gray is the absorption of one joule of energy, in the form of ionizing radiation, by one kilogram of matter.

$$1\ \text{Gy} = 1\ \frac{\text{J}}{\text{kg}} = 1\ \frac{\text{m}^2}{\text{s}^2}$$

For ➚ Gamma Radiation, these are the same base units as the ➚ Sievert. To avoid confusion, do no not use J/kg but always Gy for the absorbed dose and Sv for the dose equivalent.

Greenwich Mean Time (GMT)

Originally the mean solar time at the Royal Observatory in Greenwich, London. It is commonly but imprecisely used synonymously with Coordinated Universal Time (➚ Coordinated Universal Time) when referring to time zones.

Gy ➚ Gray

Half Life

The duration it takes for a substance undergoing ➚ Decay to decrease by half.

HAZMAT, Hazmat, HazMat

Hazardous materials and items, dangerous goods.

^{3}He Tube

A device to detect thermal ➚ Neutrons (➚ Neutron Detection) consisting of a tube filled with high-pressure ^{3}He and other gases in a strong electric field. Incident neutrons react with the helium yielding a ➚ Gamma Radiation which can be detected similar as in a ➚ Geiger-Müller Tube.

HPGe

High-Purity ➚ Germanium.

HPRDS

Human Portable Radiation Detection System

HTTP

➚ Hypertext Transfer Protocol

Hypertext Transfer Protocol (HTTP)

A networking protocol for distributed, collaborative, hypermedia information systems, essential for data communication in the World Wide Web.

IANA

↗ Internet Assigned Numbers Authority

International Organization for Standardization

↗ ISO

International System of Units

↗ SI

Internet Assigned Numbers Authority (IANA)

An organization responsible for the allocation of globally-unique names and numbers that are used in Internet protocols.

Internet Protocol (IP)

A protocol used for data communication between devices in a network.

Ion A ↗ Nucleus whose number of ↗ Electrons differs from the number of ↗ Protons resulting in a net negative or positive electric charge.

Ionizing Radiation

↗ Particle Radiation or ↗ Electromagnetic Radiation energetic enough to detach ↗ Electrons from atoms or molecules, thus converting them to ↗ Ions.

Ionization depends on the energy of radiation, not on their number or wavelength. Roughly speaking, particles or photons with energies above a few ↗ Electron Volts are ionizing.

■ Ionizing Radiation can cause serious damage when absorbed by living tissue, and is therefore a health hazard.

IP ↗ Internet Protocol

IP Address

A unique numerical label that is assigned to devices participating in an ↗ Internet Protocol-based computer network. Usually it is a 32-bit

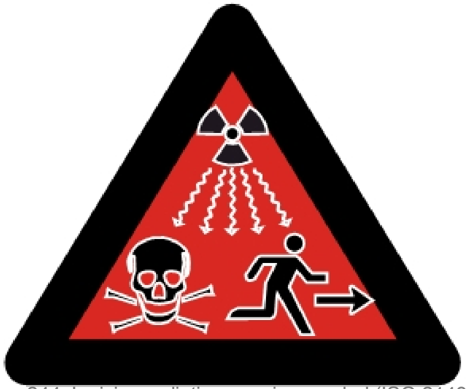

Figure 244. Ionizing radiation warning symbol (ISO 21482)

number written in four 8-bit bytes, for example 192.168.10.199. It is used to identify hosts or network interfaces and to address locations.

IrOBEX

↗ OBject EXchange

ISO (International Organization for Standardization)

The world's largest developer and publisher of International Standards. ISO is a network of the national standards institutes of countries around the world.

Isobar

Different ↗ Nuclides having the same ↗ Mass Number, for example $^{40}_{18}$Ar and $^{40}_{19}$K or $_{36}$Kr and $_{34}$Se.

Isomer

An excited state in a ↗ Nucleus having a very long ↗ Half Life compared to other excited states: at least a µs or ms. Some isomers expose a much longer half life so they are called metastable (m), for example ^{99m}Tc with a half life of about 6 h.

Isotone

Different ↗ Nuclides having the same number of ↗ Neutrons, for example ^{36} $_{16}$S, $_{18}$Ar, $_{19}$K, and $_{20}$C} with 20 neutrons each but a different ↗ Atomic Number.

Isotope

Different ↗ Nuclides having the same number of ↗ Protons (also known as ↗ Atomic Number) belonging to the same chemical ↗ Element, for example $^{234}_{92}$U, 292 U and 292 U.

J ↗ Joule

Joule (J)

The ↗ SI derived unit of energy (↗ Electron Volt). It is the energy required to apply a force of one newton through a distance of one meter (1 N·m) or the work required to produce one watt of power for one second (1 W·s).

$$1\ \mathrm{J} = 1\ \mathrm{N} \cdot \mathrm{m} = 1\ \frac{\mathrm{kg} \cdot \mathrm{m}}{\mathrm{s}^2} \cdot \mathrm{m} = 1\ \mathrm{W} \cdot \mathrm{s}$$

KCl ↗ Potassium Chloride

LaBr3

↗ Lanthanum Bromide

Lanthanum Bromide (LaBr3)

Substance to build ↗ Scintillation Counters.

LED Light Emitting Diode

LED Stabilization

Method to adjust for the drift of a ↗ Photo Multiplier Tube by measuring the light of a known reference ↗ LED.

Linearization

Measurements relying on ↗ Scintillation require ways to transfer and amplify light. This is typically done by using a crystal mounted to a↗ Photo Multiplier Tube. Unfortunately, the physics of this assembly introduces a non-proportionality between the input gamma ray energies and the processed electronic output signals. For high precision spectroscopy applications it is therefore inevitable to carefully gauge the assembly to map the non-proportional deviating energies on to the correct incident values. This process is referred to as Linearization.

Live Time (LT)

A detection system is able to record events during the live time, that is, while not being busy processing events in the ➚ Dead Time (cf ➚ Real Time).

Local Maximum

➚ Peak

Low Self-Discharge Nickel-Metal Hydride (LSD NiMH)

The type of rechargeable batteries built into the ICx powerPACK ultra.

LSD NiMH

➚ Low Self-Discharge Nickel-Metal Hydride

LT ➚ Live Time

MAC Address

➚ Media Access Control Address

Mass Number (A)

The total number of ➚ Protons and ➚ Neutrons (together known as ➚ Nucleons) in an atomic ➚ Nucleus.

Also known as: Atomic Mass Number, Nucleon Number

MCS

➚ Multi Channel Scaling

Media Access Control Address (MAC Address)

A unique identifier assigned to most network adapters or network interface cards by the manufacturer for identification in a network.

Metric Prefixes

➚ Unit Prefixes

Military Time

➚ 24-Hour Clock

Moderator

A medium with a high content of hydrogen (e.g. ➚ Polyethylene) reducing the speed of fast ➚ Neutrons, thus turning them into thermal neutrons. Used for example, to enhance ➚ Neutron Detection sensitivity for systems which can detect thermal neutrons only.

Multi Channel Scaling (MCS)

An acquisition mode for discrete ➚ Spectra. All counts N registered during a period mt are stored in one channel. After that period, all counts are stored in the next channel, and so on (Figure 245, p. 264).

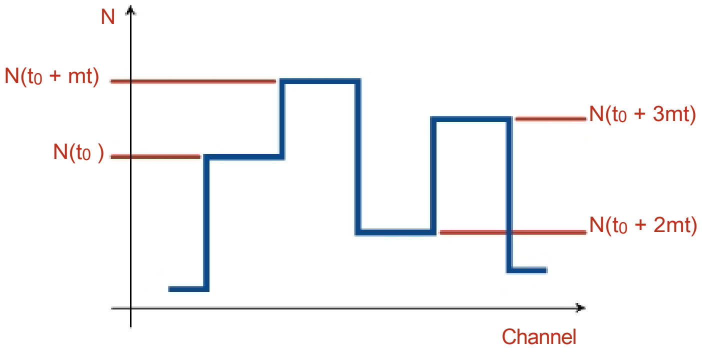

Figure 245. Multi Channel Scaling

N42 ➚ ANSI N42.42

*.n42

Common file name suffix for ➚ ANSI N42.42 files.

NaI ➚ Sodium Iodide

Naturally Occurring Radioactive Material (NORM)

➚ Radionuclides occuring in the Earth lithosphere or atmosphere, for example, potassium, uranium and their daughter products.

Navstar Global Positioning System

➚ Global Positioning System

Neutron

A subatomic particle with no electric charge, usually found in the ➚ Nucleus of atoms. Neutrons bound in nuclei are stable, free neutrons, however, undergo beta ➚ Decay with a mean lifetime of about 12 minutes. Free Neutrons having different energies are categorized by the ➚ Neutron Temperature.

Neutron Detection

Thermal neutrons (➚ Neutron Temperature) can be detected by observing their interaction with ↗ Nuclei like ^{3}He (↗ ^{3}He Tube), ^{6}Li, ^{10}B, or ^{157}Gd. These interactions produce ↗ Particle Radiation or ↗ Gamma Radiation which is subsequently detected. To detect fast neutrons (↗ Neutron Temperature), a ↗ Moderator must be applied.

Neutron Temperature

An energy scale for free ↗ Neutrons. The most important categories are fast neutrons, having an energy substantially above 1 eV, slow Neutrons, with an energy below 0.4 eV and thermal neutrons yielding an energy about 0.025 eV. Fast neutrons are deccelerated or thermalized by a ↗ Moderator.

Nickel-Metal Hydride (NiMH)

The type of rechargeable batteries built into the ICx powerPACK plus.

NID Nuclide Identification

NiMH

↗ Nickel-Metal Hydride

NORM

↗ Naturally Occurring Radioactive Material

Nuclear Fission

↗ Fission

Nuclear Fusion

↗ Fusion

Nucleon

Collective name for ↗ Neutrons and ↗ Protons, two subatomic particles building an atomic ↗ Nucleus.

Nucleon Number

↗ Mass Number

Nucleus

The nucleus is a component of an atom, carrying the majority of the net mass and an electric charge that is equal to the charge of all ↗ Electrons that orbit the nucleus. A nucleus consists of ↗ Neutrons and ↗ Protons, which are therefore also called ↗ Nucleons.

Nuclide

A nuclide is a ↗ Nucleus with a specified number of protons and neutrons, that is, having specific nuclear properties.

Nuclides are specified by the name of the chemical ↗ Element which implies the ↗ Atomic Number and the ↗ Mass Number, for example, $^{40}_{18}\mathrm{Ar}$ or $^{40}_{19}\mathrm{K}$. Where sub- and superscripting are not possible or too challenging, nuclides are often written as Ar-40 or K-40.

OBEX

↗ OBject EXchange

OBject EXchange (OBEX)

A communications protocol for the exchange of binary objects between devices. It is maintained by the Infrared Data Association but has also been adopted by the Bluetooth Special Interest Group and the SyncML wing of the Open Mobile Alliance.

Also known as: IrOBEX

Pairing

A mechanism to establish a trusted connection between two devices communicating via Bluetooth requiring user interaction only during the first connection of two particular devices.

Particle Radiation

A type of ↗ Radiation, whose emission components carry a finite rest mass. ↗ Alpha Radiation and ↗ Beta Radiation are examples for Particle Radiation.

PE ↗ Polyethylene

Peak

The place where a function or a measurement (or a graphic rendering therof) is higher than in the close vicinity (Figure 243, p. 257).

Also known as: Local Maximum

PHA ↗ Pulse Height Analyzer

Photo Multiplier Tube (PMT)

An extremely sensitive light detector used, for example, in conjunction with a ↗ Scintillator to register ↗ Ionizing Radiation.

PIN Personal Identification Number

PMMA

➚ Polymethyl Methacrylate

PMT ➚ Photo Multiplier Tube

Polyethene

➚ Polyethylene

Polyethylene (PE, $(C_2H_4)_n$)

A substance usable as ➚ Moderator for fast ➚ Neutrons.

Also known as: Polyethene, Polymethylene, Polythene

Polymethyl Methacrylate (PMMA, $(C_5O_2H_8)_n$)

A substance usable as ➚ Moderator for fast ➚ Neutrons.

Also known as: Acrylic Glass

Polymethylene

➚ Polyethylene

Polythene

➚ Polyethylene

Positron

A subatomic particle with a positive electric charge, counterpart of the ➚ Electron. It is emitted as ➚ Beta Radiation.

Potassium Chloride (KCl)

A salt containing natural ^{40}K used to calibrate radiation detection systems.

Proton

A subatomic particle with a positive electric charge. It builds the ➚ Nucleus of each atom, along with ➚ Neutrons. A proton is also stable by itself and has a second identity as the hydrogen ➚ Ion, H^+.

Proton Number

➚ Atomic Number

Pulse Height Analyzer (PHA)

An instrument which accepts electronic pulses of varying heights from particle and event detectors, digitizes the pulses' heights, and saves them in channels for spectral analysis.

Radiation

The propagation of energetic particles (➚ Particle Radiation) or electromagnetic waves (➚ Electromagnetic Radiation) through a medium or space. Examples are ➚ Alpha Radiation, ➚ Beta Radiation, ➚ Gamma Radiation, ➚ Neutrons but also X-rays, radio waves, light, microwaves or heat.

The word " Radiation" commonly is used as an abbreviation for ➚ Ionizing Radiation.

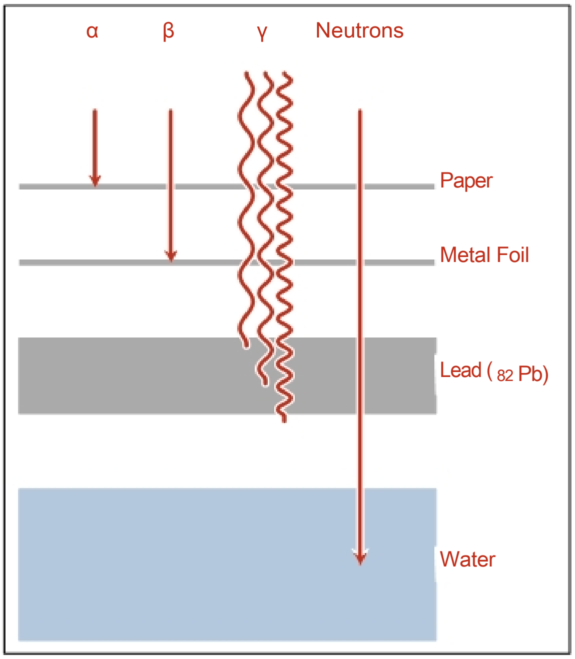

Figure 246. Shielding of alpha, beta and gamma radiation (not to scale)

Radio Time

➚ 24-Hour Clock

Radioactive Decay

➚ Decay

Radiological Dispersal Device

➚ Radiological Dispersion Device

Radiological Dispersion Device (RDD)

A weapon designed to spread radioactive material with the intent to kill or cause disruption.

Also known as: Radiological Dispersal Device, Dirty Bomb

Radionuclide

A radioactive ➚ Nuclide.

Railway Time

➚ 24-Hour Clock

RDD ➚ Radiological Dispersion Device

Reachback

The process of transmitting information from a field deployed instrument to a lab or other facility for further analysis.

Reactor-Grade Plutonium (RGPu)

Reactor-Grade Plutonium is a special mixture of ^{239}P€, ^{240}P€ and other ➚ Isotopes, which contains ≥ 19 % ^{240}P€. ^{240}P€ has a high rate of spontaneous fission leading to an increased number of ➚ Neutrons and bears the risk of premature starting chain reactions. Further grades are ➚ Fuel-Grade Plutonium and ➚ Weapons-Grade Plutonium.

Real Time (RT)

The real or total time of a detection system comprises the ➚ Live Time and the ➚ Dead Time.

Also known as: Total Time, True Time

Region of Interest (ROI)

A selected subset of samples within a ➚ Spectrum identified for a particular purpose.

rem ➚ Röntgen Equivalent in Man

Remote Network Driver Interface Specification (RNDIS)

A Microsoft-proprietary protocol providing a virtual Ethernet connection used mostly via ➚ USB.

Resolution

In spectroscopical application, the resolution gives a useful measure to estimate how well two or more ➚ Peaks can be distinguished. It is consequently defined as the width of a peak - usually the most prominent line at 661.65 keV of ^{137}Cs. Because there are various ways to judge a peak width, it is a convention to use the ➚ Full Width at Half Maximum.

RGPu

➚ Reactor-Grade Plutonium

RID ➚ Radionuclide Identifying Device

RNDIS

➚ Remote Network Driver Interface Specification

ROI ➚ Region of Interest

Röntgen Equivalent in Man (rem)

The röntgen equivalent in man is an old unit of radiation ➚ Dose. (➚ Sievert)

$$100 \text{ rem} = 1 \text{ Sv}$$

The continued use of rem is “ strongly discouraged” by the U.S. National Institute of Standards and Technology.

RT ➚ Real Time

Scintillation Counter

A device to measure ➚ Ionizing Radiation by amplifying the light emitted from a ➚ Scintillator with a ➚ Photo Multiplier Tube and quantifying the result.

Scintillator

A material emitting a flash of light when it absorbs ➚ Ionizing Radiation.

Semiconductor Radiation Detector

A semiconductor (for example ➚ Germanium or ➚ Cadmium Zinc Telluride) placed between two electrodes registering electric pulses resulting from the travel of free electrons produced by incident

➚ Gamma Radiation. The number of free electrons is proportional to the radiation's energy.

SI (Système International d'Unités)

A metric and decimal system of units, standardized by the Bureau International des Poids et Mesures (International Bureau of Weights and Measures).

Also known as: International System of Units SI

Prefixes

➚ Unit Prefixes

Sievert (Sv)

The ➚ SI derived unit of dose equivalent. It attempts to reflect the biological effects of ➚ Ionizing Radiation as opposed to the physical aspects, which are characterised by the ➚ Absorbed Dose (➚ Gray).

$$1\ \mathrm{Sv} = 1\,\frac{\mathrm{J}}{\mathrm{kg}} = 1\,\frac{\mathrm{m}^2}{\mathrm{s}^2}$$

For ➚ Gamma Radiation, these are the same base units as the ➚ Gray. To avoid confusion, do not use J/kg but always Gy for the absorbed dose and Sv for the dose equivalent.

SIM Subscriber Identity Module, used for example in mobile phones.

Sodium Iodide (NaI)

Substance to build ➚ Scintillation Counters.

SOP ➚ Standard Operating Procedure

Source Stabilization

Method to adjust for the drift of a detection system by measuring the radiation of a known reference source.

*.spc

A file format used by former models of the identiFINDER to store spectrum data. Was replaced by the more versatile and standardized ➚ ANSI N42.42 format.

Spectrum

The continuous arrangement of the components of ➚ Radiation in a progressive series according to a characteristic quantity such as wavelength, frequency, energy, charge, mass etc. Using this arrangement as one axis, another quantity, e.g. intensity, can be plotted along a perpendicular axis

Digital spectra are discrete, that is they collect the plotted quantitiy into separate channels representing a (small) range of the characteristic quantity.

Standard Operating Procedure (SOP)

A set of instructions for a procedure to be executed always in exactly the same manner.

Also known as: Standing Operating Procedure

Standing Operating Procedure

➚ Standard Operating Procedure

Sv ➚ Sievert

Système International d'Unités

➚ SI

Technologically Enhanced Naturally Occurring Radioactive Material (TENORM)

➚ Naturally Occurring Radioactive Material as used in, for example, oil and gas exploration, development and production operations.

TENORM

➚ Technologically Enhanced Naturally Occurring Radioactive Material

Tethering

Using a mobile device such as a mobile phone to supply Internet access for another device which is otherwise unconnected, using the mobile device as a modem. This can be done through, for example, ➚ Bluetooth wireless technology or cables (such as ➚ USB).

Thermal Neutron

➚ Neutron Temperature

Total Time

➚ Real Time

Trickle Charging

Charging a battery to balance its intrinsic self discharge thus maintaining the full capacity of the battery.

True Time

↗ Real Time

Uniform Resource Identifier (URI)

A string of characters used to identify a name or a resource on the Internet.

Unit Prefixes

Prefixes for ↗ SI units (Table 7, p. 273)

Table 7. Prefixes for units according to the Système International d'Unités (International System of Units)

	Prefix	Symbol	Decimal
10^{24}	yotta	Y	1000000000000000 000 000 000
10^{21}	zetta	Z	1000000000000000 000 000
10^{18}	exa	E	1000000000000000 000
10^{15}	peta	P	1000000000000000
10^{12}	tera	T	1000000000000
10^{9}	giga	G	1000000000
10^{6}	mega	M	1000000
10^{3}	kilo	k	1000
10^{2}	hecto	h	100
10^{1}	deca	da	10
10^{0}			1
10^{-1}	deci	d	0.1
10^{-2}	centi	c	0.01
10^{-3}	milli	m	0.001
10^{-6}	micro	µ	0.000001
10^{-9}	nano	n	0.000000001
10^{-12}	pico	p	0.000000000001
10^{-15}	femto	f	0.000000000000001
10^{-18}	atto	a	0.000000000000000001
10^{-21}	zepto	z	0.000000000000000000001
10^{-24}	yocto	y	0.000000000000000000000001

Also known as: Metric Prefixes, SI Prefixes

Units of Time

The ↗ SI base unit for time is the second. It may be prefixed with the usual SI ↗ Unit Prefixes to express smaller or larger quantities.

Units known from everyday life (Table 8, p. 274) are often used for larger quantities.

Table 8. Units of time

Unit	Symbol	Relation
Second	sec, s	
Minute	min, m	60 sec
Hour	h	60 min
Day	d	24 h
Year	a	365.25 d

The Year is often prefixed (see Table 7, p. 273) to express very large quantities like 1.3 Ga for 1.3 billion years (the ↗ Half Life of ^{40} K).

Universal Serial Bus

↗ USB

URI ↗ Uniform Resource Identifier

USB (Universal Serial Bus)

A specification to establish communication between various types of devices and a host controller, usually a personal computer.

UTC ↗ Coordinated Universal Time

Weapons-Grade Plutonium (WGPu)

A mixture of ^{239} P€, ^{240} P€ and other ↗ Isotopes, which contains less than 7% ^{240} P€. Due to its reduced amount of the spontaneous fission source ^{240} P€, the risk of a premature chain reaction start is decreased so that this blend of Plutonium is used for the weapon head assemblies. Further grades are ↗ Fuel-Grade Plutonium and ↗ Reactor-Grade Plutonium.

WGPu

↗ Weapons-Grade Plutonium

WGS84

↗ World Geodetic System

World Geodetic System (WGS84)

A standard for use in cartography, geodesy, and navigation comprising a coordinate system for the Earth, a reference surface for raw altitude data, and a geoid defining the nominal sea level.

The WGS release of 1984 with later revisions is used by ➚ Global Positioning System.

XML (Extensible Markup Language)

A gratis open standard for encoding arbitrary data in textual files.

Z ➚ Atomic Number

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